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ANNALS OF INTERNAL MEDICINE

VOLUME 7

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NUMBER 12

TREATMENT OF ANGINA PECTORIS AND CONGESTIVE HEART FAILURE BY TOTAL ABLATION OF THE THYROID IN PATIENTS WITHOUT THYROTOXICOSIS

X. WITH PARTICULAR REFERENCE TO THE PRE- AND POST-OPERATIVE MEDICAL MANAGEMENT *

By H. L. BLUMGART, D. D. BERLIN, DAVID DAVIS, J. E. F. RISEMAN and
A. A. WEINSTEIN, *Boston, Massachusetts*

IN the treatment of patients with congestive failure and angina pectoris, one not infrequently finds that despite all available medical measures the patients, while improved, nevertheless continue to remain chronically incapacitated. It is well recognized that exercise, emotion and other factors which increase cardiac work tend to increase congestive heart failure and angina pectoris. The enforcement of diminished activity or complete bed rest benefits patients by reducing the demands on the heart. The use of sedatives and the action of digitalis in reducing the ventricular rate in auricular fibrillation have a similar effect.^{3, 10, 27}

The same considerations underlie the treatment of thyrotoxic heart disease.^{22, 23} It has long been known that in thyrotoxicosis subtotal thyroidectomy usually accomplishes permanent lowering of the basal metabolic rate from abnormally high levels to a normal level, with coincident improvement in congestive failure^{15, 16, 17, 18} or angina pectoris^{19, 20} as the demands on the heart are lessened.⁴ Conversely, patients with spontaneous myxedema not infrequently develop angina pectoris or the signs and symptoms of congestive failure because of the increased demands on the heart when thyroid is administered.^{5, 8, 21, 24}

We have attempted to extend this therapeutic principle of diminution in cardiac work by still further lessening the demands on the heart in patients with intractable heart disease. This has been done by purposefully inducing the low metabolic rate of hypothyroidism through total ablation of the thyroid gland. Subtotal removal of the normal thyroid gland does not assure persistent lowering of the basal metabolic rate from

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From the Medical Service and Research Laboratories of the Beth Israel Hospital, and the Department of Medicine, Harvard Medical School, Boston.

This investigation was aided by a grant from the William W. Wellington Memorial Research Fund of the Harvard Medical School, Boston.

normal levels to subnormal levels.^{2,6} Maximal subtotal removal of the normal gland may occasionally induce persistent hypothyroidism, but many patients will not show a permanent reduction in metabolic rate. In such instances, subsequent surgical attempts to remove residual fragments have been unsuccessful; nor have the residual fragments of gland been affected by heavy roentgen-ray radiation to the point of dermatitis.^{2,12} In brief, our work has demonstrated that nothing short of complete removal of every vestige of thyroid tissue can assure the production of persistent hypothyroidism.

In a series of 60 patients with intractable heart disease, we have removed the entire normal thyroid gland with results that are encouraging. Most of these patients were chronic invalids, having suffered from congestive heart failure or angina pectoris, which was unrelieved in spite of the employment of all available therapeutic measures over a period of years. The condition of all these patients was such that any significant improvement could be definitely attributed to the operative procedure. Of the 40 patients with congestive heart failure due to various etiologies, over half the patients have been economically rehabilitated and have been able to resume light or moderately heavy work. These patients have shown no recurrence of signs or symptoms of failure over a period of three to 16 months, in spite of such activity. They are still handicapped individuals in that they are probably not able to undertake heavy manual labor. In the 16 months that have elapsed since the first operation was performed, five patients have suffered temporary recurrent cardiac failure, in three of whom it was due to the omission of digitalis, over exertion, or recurrence of bronchial asthma.

In the 20 patients with angina pectoris, attacks of pain were experienced repeatedly, either at rest or on relatively moderate exertion before operation.²⁵ Ten patients have had no recurrence of attacks since operation. Of the remaining ten patients, seven have shown capacity to perform two to three times as much work as preoperatively before experiencing pain, and three patients have shown but little clinical improvement.

In this series of 60 patients, there have been six postoperative deaths, a mortality rate of 10 per cent. It should be noted that all deaths occurred in patients with advanced congestive failure and were all due to postoperative pulmonary complications. It should also be noted that these six deaths occurred in the first 40 operations that were performed. In the last 20 patients who were as seriously incapacitated as the first group of 40, there have been no deaths. Of the patients with congestive failure, five have died subsequently at two, four, six, eight and 12 months respectively after operation. One patient died after a cerebral embolus; one after alcoholic and other excesses; one following a bout of acute pulmonary edema; one as a result of progression of luetic heart disease, another of congestive heart failure. No patient with angina pectoris has died during or since the operation. One has had an attack of acute coronary occlusion from which he recovered. The clinical course of those patients who have been operated

on over a year ago is most encouraging in that more than half have been able to maintain the degree of benefit conferred by the operation without evidence of recurrence of failure or of any encroachment on their cardiac reserve.

SELECTION OF PATIENTS

The criteria for the proper selection of patients can be established only after the results have been observed over a period of years in numerous patients, representing the various forms and degrees of severity of cardiovascular disease. Although we have operated on 60 patients with cardiovascular disease during the past 16 months, the number is small from a statistical point of view and the elapsed postoperative interval too brief to permit the deduction of final conclusions. It may, however, be of value to state our tentative opinion at the present time.

The use of a therapeutic procedure as radical as this should be reserved at the present time, we feel, for those patients who in spite of all available therapeutic measures remain cardiac invalids. Only after prolonged and adequate medical treatment has failed to relieve the patient should the operation be considered. Before the operative procedure is undertaken, the patient's condition should be improved to the fullest possible extent so that the operative risk is minimal. Patients should not be operated on until the signs and symptoms of acute congestive failure have disappeared at complete rest in bed. Patients who gain edema in spite of prolonged rest in bed are poor candidates for operation, although a few of our most striking results have occurred in such patients. The presence of pulmonary congestion predisposes to postoperative bronchopneumonia, and most of our postoperative deaths have occurred in this group. In considering a procedure of this type, the clinician may be tempted to operate on a patient with congestive failure who is rapidly becoming worse in a desperate effort to do something for the patient. This must be avoided, for such patients will obviously not withstand the operative procedure. Patients who, in spite of medical treatment, have suffered from recurrent failure on exertion over a considerable period, but whose condition is only slowly progressive, are favorable subjects.

There is no reason to believe that the induction of hypothyroidism by the complete removal of the gland will retard the development of arteriosclerosis or impede the narrowing of the valvular orifices or retard active syphilitic aortitis. One should expect that, although patients who show a rapidly progressive preoperative clinical course may experience temporary and perhaps considerable improvement, they will probably succumb to the underlying disease process sooner than other patients with a less rapidly progressing condition. For this reason, we have not operated on patients with malignant hypertension, and have accepted only occasional cases with luetic heart disease. Similarly, patients with rheumatic or arteriosclerotic heart disease who have given a short but progressive history of failure are unfavorable candidates.

Since the effect of total thyroidectomy on the immune reactions in acute infections is unknown, the presence of active rheumatic involvement contraindicates the operation at present. It would, moreover, be difficult to judge whether improvement in such patients was due to the cessation of active infection or the results of thyroidectomy. Similarly, patients with pulmonary infection, such as bronchiectasis, are much more likely to develop bronchopneumonia during or after operation. Patients with recent coronary thrombosis are of course poor operative risks. Seven of our patients had a history of one to three previous attacks of coronary thrombosis, but in every instance the last attack had occurred at least four months before operation. The presence of renal insufficiency contraindicates the procedure.

Our experience indicates that a basal metabolic rate of less than minus 15 per cent before operation is an unfavorable factor, and a basal metabolic rate lower than minus 20 per cent probably contraindicates the operative procedure. Our experience shows that when the basal metabolic rate reaches a level of about minus 30 per cent small doses of thyroid are indicated in order to obviate the development of fatigability, puffiness of the face, mental slowing and other distressing symptoms and signs of myxedema. In accord with our previous studies,^{3,6,7} patients who showed a basal metabolic rate of minus 20 per cent before operation therefore experienced but slight cardiac improvement before their basal metabolic rate dropped to about minus 30 per cent, the level at which the symptoms of myxedema necessitated the administration of thyroid. Our clinical results have been in accord with these considerations, for of the six patients who have shown but little improvement, four showed low preoperative metabolic rates.

Insofar as the extent of duration of improvement after operation depends in large part on the degree of preëxisting cardiac pathology and the residual functional capacity of the heart, patients must not expect to be able to go back to strenuous activity. If they are bedridden with congestive failure or angina pectoris, they probably will enjoy freedom from failure or pain when up and about. If before operation they become decompensated or develop angina only on mild exertion, they will enjoy a moderate increase in activity. If preoperatively they develop congestive failure or angina only on moderate exertion, they will probably be able to do productive work without the development of such signs and symptoms.

It may be helpful to state our present conception of a hypothetical case of congestive failure that we would consider a very favorable candidate for operation. The patient would be between 20 and 50 years of age with arteriosclerotic or rheumatic heart disease, and a basal metabolic rate of about the average normal. He has no evidence of bronchiectasis, severe renal insufficiency, active rheumatic infection, nor recent coronary thrombosis. This hypothetical patient has suffered, for several years, from dyspnea, congestion of the lungs, engorgement of the liver and edema of the legs on slight exertion, so that he is unable to work in spite of medical and

hospital treatment. His condition has not become rapidly worse but he is incapacitated. He always regains circulatory compensation after resting in bed for several weeks, indicating that he still has some cardiac reserve. His condition does not permit him, however, to undertake normal activities. Since he becomes edema free at rest, the risk of operation is slight. Since he has not shown a rapidly progressive downhill course, his prognosis after thyroidectomy is good. He will probably be able to lead a definitely more active life than before, without becoming decompensated. The hypothetical patient with angina pectoris has attacks on slight exertion but not at rest and does not show any of the unfavorable factors mentioned above. He will probably be completely free of attacks after operation, or develop attacks only after moderately severe exertion.

PREOPERATIVE MANAGEMENT

We have treated our patients with all available medical measures preoperatively until they showed no further improvement in order that their condition might be as favorable as possible before operation and the risk of operation be reduced to a minimum.⁷ All our patients are at best fragile operative risks and cannot withstand the complications that other more normal subjects might easily surmount. Before operation all patients have been kept at complete rest in the hospital for several weeks to several months, depending upon the signs and symptoms of failure and the length of time spent at rest prior to entry. Patients who suffer from pulmonary congestion in spite of prolonged rest and show cyanosis may be benefited by oxygen therapy. Dr. Alvan Barach of New York informs us that he has found this adjunct in therapy particularly helpful in his patients.¹ In patients with auricular fibrillation, somewhat greater doses of digitalis are necessary before operation than are usually employed in order that the ventricular rate shall be adequately controlled during the course of the operation. Medicines which we intend to use during the operative or postoperative course are always administered days or weeks before operation and their effects observed. Morphine has been administered to each patient some days before operation in order to be certain that no hypersensitivity or idiosyncrasy exists. In some patients in whom such a state has existed, we have resorted to other drugs. Patients usually receive one of the barbituric acid derivatives the night before operation, and again early on the day of operation. It is advisable to give sufficient preoperative sedation to produce drowsiness; narcosis, however, is to be avoided. If patients are still alert or nervous immediately before operation, $\frac{1}{6}$ or $\frac{1}{4}$ grain of morphine is injected subcutaneously.

OPERATIVE COURSE

All operations are now performed under local anesthesia. Patients with congestive failure are placed almost in the orthopneic position on the operating table to avoid respiratory embarrassment and to collapse distended veins in the operating field. A medical advisor is present at all operations

to follow the reaction of the patients to operation. If necessary, the operation is terminated at his suggestion. One lobe of the thyroid is removed and direct laryngoscopy is then performed by Dr. Louis M. Freedman.¹¹ If the recurrent laryngeal nerve on the side of operation has been injured and the vocal cord on that side has been paralyzed, the operation is terminated, obviating the danger of bilateral vocal cord paralysis. In only two instances has interruption of the operation been necessary. In both of these cases the function of the vocal cord returned to normal and the other lobe was subsequently removed. The surgical precautions to be observed are of the greatest importance. Total thyroidectomy presents surgical difficulties in relation to the recurrent laryngeal nerves and the parathyroid glands, not inherent in the usual subtotal thyroidectomy. These problems have been fully discussed elsewhere by Dr. David D. Berlin, who has been in charge of the surgical aspects of this work.^{2, 6, 7}

POSTOPERATIVE MANAGEMENT

Patients who undergo the operation according to the above régime have shown but slight postoperative reaction. Experience has shown that postoperative complications are minimized if sedatives are administered as sparingly as is consistent with maintaining the patient comfortable. Patients are awake immediately after operation and raise accumulated bronchial secretions, thereby reducing the danger of postoperative bronchopneumonia to a minimum. Fluids can be taken by mouth immediately after operation, thereby obviating the discomfort of hypodermoclysis. In patients with persistent edema, fluids and salt are of course restricted, and oxygen therapy is frequently employed immediately after operation. These patients are followed closely by a medical intern, following the suggestions of the medical staff. Special day and night nurses are employed who are familiar with the care of these patients and are trained to recognize early signs of respiratory distress and parathyroid insufficiency. Parathyroid tetany in the sense of convulsions, etc., has never occurred in our cases.¹³ Between the first and fifth postoperative days, 12 patients have shown numbness and tingling in various parts of the body, positive Trousseau and positive Chvostek signs. These manifestations of latent tetany have been satisfactorily controlled by the administration of 4 to 16 c.c. of 35 per cent calcium chloride solution every four or six hours; an initial dose of 10 to 20 c.c. of 10 per cent solution has been given intravenously in certain cases when an immediate effect was desired. If calcium chloride is not well tolerated by the patient, calcium lactate or calcium gluconate may be employed. The addition of a quart or more of milk to the diet is of value in providing additional calcium. Of these patients, only two are still receiving calcium medication.

The early relief of symptomatology immediately after the operation is due to interruption of afferent nerve pathways, bearing impulses from the heart to the central nervous system.²⁰ This improvement is usually temporary, lasting several weeks. Although patients feel considerably improved

immediately after operation, experience indicates that complete bed rest should be enforced until the basal metabolic rate has shown a significant lowering of approximately 20 per cent from its preoperative level. Rest in bed for three or four weeks after operation is usually advisable. Activity should be increased only gradually during the following weeks.

In all patients, persistent hypothyroidism has intervened. The extent of permanent relief has in general been related to the degree of reduction in the basal metabolic rate.⁷ With a lowering of the basal metabolic rate, patients show what may be termed the mild symptoms and signs of myxedema, which consist of increased sensitivity to cold, somewhat thickened and dry skin, and slow growth of hair. With basal metabolic rates of minus 30 per cent or lower, most patients suffer from puffiness of the face, weakness of the legs, and irritability. By the administration of small doses of thyroid, the basal metabolic rate can be successfully maintained at a level of minus 25 to minus 30 per cent, which frees the patient from the untoward symptoms of myxedema, but which nevertheless decreases the burden on the heart. The optimum metabolic rate level for each patient varies somewhat but is usually between minus 25 and minus 30 per cent. One-fourth grain thyroid is usually sufficient to maintain this level, but in some patients only $\frac{1}{8}$ grain is necessary, while in others $\frac{1}{2}$ grain is needed.^{9, 14} The optimum dose of thyroid must be ascertained in each patient on the basis of the clinical signs and symptoms of hypothyroidism, basal metabolic rate measurements, and, at times, determination of the serum cholesterol concentration.¹⁴ All patients should be seen at least once a month for it is entirely unnecessary for a patient to suffer from the distressing symptoms of myxedema.

Throughout their lives these patients should receive the same close medical observation and treatment that all cardiac patients require. The management of the cardiac condition is usually the same as before the operation as regards drugs, although in a few patients with auricular fibrillation it has seemed that slightly less digitalis is necessary. Most patients feel so much better that they must be warned not to overdo. Operation does not alter the underlying pathological process, and so it is important that they should not overtax themselves. Some of our patients because of their economic situation are working 12 to 16 hours a day, and one patient who previously suffered from angina pectoris has been working as a day laborer for over six months. This is clearly inadvisable. A few patients who similarly have been forced to work strenuously have suffered temporary recurrence of congestive failure or angina pectoris. Other patients have their previous sufferings so vividly before them that they must be encouraged to undertake effort. The fear of recurrence of angina pectoris or congestive failure presents a serious psychological problem in some patients.

The social-economic problems in our patients have been many. Some of our young patients have been invalided since adolescence and have had

to be taught an occupation. Others, while unable to undertake the heavy work of their occupation before they were invalided, have been able to secure employment demanding less strenuous effort. These considerations are exemplified by the first patient, a chef, in whom the entire thyroid gland was removed on December 15, 1932. He suffered from angina pectoris and congestive heart failure and had been confined to bed for over two years. Edema of the legs appeared if he was up and about for even a few hours and was accompanied by substernal pain radiating to the left scapula and left arm, relieved only temporarily by nitroglycerine. He has been unable to go back to his previous occupation, but is able to carry on as a porter in our laboratories, doing light work eight hours daily. If he attempts to increase his activity by moving beds or lifting heavy objects, he experiences pain over his scapula which subsides immediately on cessation of effort.

The final appraisal of this new therapeutic procedure awaits the results attained in numerous patients with various types of cardiovascular disease. Whether the duration of life is actually prolonged by this treatment can only be ascertained by studying the subsequent history of these patients over a longer period of time. At present we may state, however, that we have been able to prolong the useful and comfortable life of most of our patients since they were almost all incapacitated before operation. The results are encouraging and the operation should be considered in patients who are incapacitated and who conform to the considerations outlined in this communication.

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A STATISTICAL EVALUATION OF DIFFERENT METHODS FOR THE DETECTION OF ARTERIOSCLEROSIS IN DIABETES MELLITUS*

By I. M. RABINOWITCH, F.A.C.P., W. L. RITCHIE, and S. HANFORD
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THE purpose of this paper is to report the results of a statistical evaluation of different methods for the detection of arteriosclerosis in diabetes mellitus. This investigation was prompted by the high and increasing incidence of vascular disease among diabetics and its influence upon mortality.

In spite of control of coma and of tuberculosis—the two major causes of death among diabetics in the past—the death rate from diabetes mellitus in large populations is still high; and mortality and morbidity data clearly indicate that cardio-vascular disease is one of the most important contributing factors. In table 1, are recorded cardiovascular conditions and their incidences among 1500 diabetics in the Clinic for Diabetes at The Montreal General Hospital.

TABLE I
Cardio-Vascular Conditions among 1500 Diabetics in the Clinic for Diabetes at the Montreal General Hospital

Condition	Number	Average Age (years)
Angina pectoris.....	19	58.5
Cataract.....	85	61.3
Cerebral arteriosclerosis.....	14	60.5
Cerebral hemorrhage.....	13	60.4
Cerebral spasm.....	12	56.0
Cerebral thrombosis.....	18	61.7
Coronary thrombosis.....	7	55.8
Gangrene.....	118	61.5
Hypertension.....	249	56.3
Intermittent claudication.....	4	54.0
Myocarditis.....	50	59.4
Pre-uremia.....	2	62.5
Uremia.....	7	55.0

The above do not include all of the cardio-vascular disturbances. In some cases, for example, the only evidence of arteriosclerosis was calcification of the arteries of the lower extremities. The arterial changes had produced no symptoms; and aside from the diabetes, these individuals were healthy. The calcifications were discovered accidentally because of our routine roentgenological examination.

Attention is drawn particularly to the high incidence of hypertension, namely, 16.6 per cent. Prior to the discovery of insulin, increased blood

* Received for publication April 3, 1934.

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pressure was not prominent among diabetics. This was to be expected, since the average duration of life from the onset of the diabetes was but a few years. Neither Elliott¹ nor Janeway² was impressed with the importance of this association. With better control of the diabetes by diet and insulin, conditions have changed. The diabetic now lives long enough to develop cardio-vascular disease.

Whether hypertension should be regarded as a clinical entity, independent of vascular disease, or whether it should be considered as a manifestation of vascular disease, is, for the purpose of this investigation, irrelevant; it is of academic interest only. Of practical importance is the fact that, when selected at random, more diabetics have hypertension than a similarly selected group of nondiabetics. That hypertension may lead to arteriosclerosis is a well recognized fact. Therefore, if hypertension is common among diabetics, in spite of control of the diabetes, and commonly leads to vascular disease, it may be properly included in this study; the relationship may be regarded as causal and not accidental.

The above incidence of vascular disease, though obviously high, would appear to be gratifying; as stated, the diabetic now lives long enough to develop these conditions, whereas in the past, death from coma and tuberculosis prevented him from doing so. The disturbing feature, however, is age. In table 1 are recorded the average ages for the corresponding conditions; and these appear to be satisfactory. Averages, however, require interpretation. One of the theorems of statistics tells us that the *arithmetical mean* of a large series of observed values is the most probable value of the quantity measured.* It should, therefore, be noted that, with very few exceptions, the above averages have been calculated from a small number of cases. Under such conditions, the *mean* is not necessarily the same as the *mode* or typical value; a few extremely high or low values could appreciably influence the *mean*, and this was found to be so. While tabulating the data we were repeatedly impressed with the young ages: angina pectoris at the age of 39 years, cerebral hemorrhage at 41 years, cerebral spasm at 37 years, cerebral thrombosis at 43 years, coronary thrombosis at 39 years; hypertension at 34 years, advanced cerebral arteriosclerosis at 37 years, marked retinitis at 47 years, cataract at 18 years, and arteriosclerosis at 12 years. At present, death from arteriosclerosis is rare among juvenile diabetics. The death rate from all causes is low among diabetic children. This, however, is no indication of ultimate prognosis. It may here be observed that life assurance companies do not accept arteriosclerotics as standard risks. Children with arteriosclerosis are no exception. Regardless of age, the expectation of life of the arteriosclerotic is definitely less than the normal.

We are not alone in these experiences. Among a group of 50 diabetics under 40 years of age in Dr. Joslin's clinic, Shepardson³ found that 18, an incidence of 36 per cent, had vascular sclerosis, according to roentgen-ray

* This holds only when the frequency distribution is symmetrical.

examination. Wilder⁴ noted a high postmortem incidence of arteriosclerosis among diabetics under 40 years of age and Shields Warren's experiences are particularly worthy of note here. In table 26 of his book on "The Pathology of Diabetes Mellitus"⁵ Warren records the findings in 264 autopsies upon diabetics. Of these 264 cases, there were 72 individuals of 40 years of age or under; and of these 72 individuals, 36 (an incidence of 50 per cent) had tissue changes secondary to arteriosclerosis. In one case, death was due directly to arteriosclerosis.

Is the incidence of arteriosclerosis increasing and, if so, is the increase more apparent than real? An apparent increase is to be expected, since other important causes of death have been greatly reduced. A little over a decade ago, coma was the chief cause of death among diabetics. This condition is rapidly disappearing; in 1933 in the Clinic for Diabetes at The Montreal General Hospital there were three cases only. That this was not accidental is shown by the small number of such cases in the immediately preceding years; in 1932, there were five; in 1931 there were five, and in 1930 there were six.

Apparent or real, the incidence of arteriosclerosis is very high. It is appreciably affecting mortality among adults and, if not controlled, must sooner or later exert the same effect among children. Control of diabetes is generally judged by the control of hyperglycemia, glycosuria and nutrition, that is, by blood and urinary sugar, body weight and activity of the individual. In view of the possibility of premature death from arteriosclerosis, it is obvious that these criteria alone do not afford a true index of progress; and it may here be observed that it affords very little comfort to know that, in a person who died of a cerebral hemorrhage or heart failure, the diabetes, at the time of death, was under ideal control; that the urine was free of sugar and acetone bodies and the blood sugar was normal. Relatives are concerned with the death and not with its cause.

Further disturbing is the fact that in the majority of these diabetics with cardio-vascular-renal disease the diabetes was mild. This emphasizes a well recognized fact, namely, that cardio-vascular or cardio-vascular-renal disease is not related to the severity, but to the duration of the diabetes. (Children are no exception to this rule.) Most of our patients with angina pectoris, coronary thrombosis, cerebral hemorrhage, hypertension, heart failure, etc. have mild diabetes; the urine is readily freed and kept free of sugar and acetone bodies and the blood sugar is kept normal or nearly so with diet alone. Relatively few of these patients require insulin.

An important problem in the management of the diabetic is, therefore, clear. If the expectation of life of the diabetic is to approach that of the normal individual, premature arteriosclerosis must be prevented and, if present, must be controlled. Prevention and control depend upon recognition of cause, early detection and appropriate treatment.

In the present article we are presenting data which bear upon the question of the diagnosis of arteriosclerosis. An attempt was made to evaluate the

relative sensitivities of a number of well recognized procedures: namely, ordinary clinical examination, examination of the ocular vessels (fundus), roentgenological examination of the legs and feet for calcification of vessels, and roentgenological estimation of the size of the heart.

CLINICAL METHODS

In many cases, clinical examination alone suffices. With such conditions as cerebral hemorrhage, gangrene, coronary thrombosis, etc., vascular disease is obvious. In all such conditions, however, the pathological changes are well advanced. The difficult problem is early diagnosis.

There are the four suggestive signs of arteriosclerosis, namely, (a) thickened radial vessels, (b) hypertension, (c) enlargement of the heart, and (d) accentuation of the aortic second sound. These, when found together, form a picture which is pathognomonic. Singly, however, they have their limitations. Palpation of the arteries is a common clinical procedure and attempts have often been made to estimate the degree of arteriosclerosis by this simple process. The practice is old, but, to quote Shields Warren⁵ it is as old as it is uncertain. It is, for example, very difficult at times to distinguish between thickness due to arteriosclerosis and a palpable artery due to hypertension. In either case, the findings at least suggest disease. The chief difficulty is interpretation of normal thickness and normal tension; it does not necessarily follow that an artery, normal according to palpation, is normal; calcification may be quite marked.

Estimation of the size of the heart may be misleading, because of the many vagaries of percussion. It is often difficult to detect slight enlargement and to interpret findings which suggest slight enlargement. Because of vagaries of the aortic second sound, this sign, also, has its limitations. Blood pressure is valuable, but it is a well recognized fact that there may be advanced arteriosclerosis without increase of pressure. In addition, there are the uncertainties of blood pressure standards.

FUNDI

The importance of examination of the fundus has been recognized for some time. Changes in the ocular vessels may often be the only evidence of vascular disease.

ROENTGEN-RAY EXAMINATION

Clinical and postmortem data show that disease of the heart and vessels of the lower extremities account for the majority of deaths among diabetics. We have, therefore, included in this study roentgen-ray examination of the heart and lower extremities.

A. Roentgen-Ray Examination of the Heart

The "six foot plate," interpreted by the Hodges and Eyster formula⁶ appears to be a reliable method for classifying hearts for statistical purposes with respect to the size of the organ. The Hodges and Eyster formula was chosen in 1931 by the Heart Committee of the New York Tuberculosis and Health Association as probably the best for this purpose, and a cardiological committee appointed by the Association of Life Insurance Medical Directors of America came to the same conclusion in 1933, after having rechecked the validity of the formula on a sizeable group of normal subjects, the data being taken partly from the literature and partly from the original records of one of the very large companies, which carefully tabulates anthropometric measurements of its head office clerical employees. The committees mentioned were of opinion that a heart should be regarded as definitely enlarged if the

total observed transverse diameter is 10 per cent or more in excess of the predicted normal by the formula mentioned. The observations covered the ages from 15 to 63 years, weights from 100 pounds to 216 pounds, and heights from five feet to six feet, three and one-half inches. Analysis showed that only 8.5 per cent of the group had a total transverse diameter of more than 10 per cent below the calculated normal diameter, and that only 4.2 per cent had transverse diameters of more than 10 per cent in excess of the predicted normal. Three and one-tenth per cent lay between plus 10 per cent and plus 12 per cent, and 1.1 per cent were between plus 12 per cent and plus 20 per cent in excess of the calculated normal. Because of these studies, it was concluded* that ± 10 per cent is a fair upper limit of normality. The permissible limits of departure from the normal in the following studies were, therefore, also ± 10 per cent.

B. Roentgen-Ray Examination of the Extremities

Labbé and Lenfant* first emphasized the importance of this method of examination and it is now widely used. Experience has shown, however, that this method also has its limitations. Roentgenological diagnosis depends upon deposition of calcium in the vessels and it is a well recognized fact that there may be advanced arteriosclerosis without such deposition.

As each of the above-mentioned methods has its limitations, an attempt was made to determine which method alone or which combination of methods affords the best means of detecting vascular disease.

METHODS OF INVESTIGATION

For this study, 1500 diabetics were selected at random from our records. In many of these cases, examinations did not include all of the above-mentioned methods. In order to make use of all data, each method was studied individually and then in different combinations with each other, whenever the necessary information was available. Brief mention of some of the clinical data is necessary here.

In 146 of the 1500 cases the only suggestive abnormalities were (a) a blood pressure of 140 mm. of Hg or over and (b) the left border of the heart was situated 10.5 cm. or more to the left of the midsternal line. Even in otherwise healthy individuals, when the blood pressure was 140 mm. of Hg, life assurance companies have repeatedly noted an increase of death rate.† However, if such blood pressure is the *only* suggestive abnormality, the applicant is not generally classified as substandard because, in the majority of cases, the finding is normal. This, also, applies to the finding of the left border of the heart at 10.5 cm. to the left of the midsternal line. In the classification of the above mentioned 146 cases, we, therefore, took

* Proceedings Association Life Insurance Medical Directors of America, 1933, xx, 184, Turner, Nichols and Ungerleider.

† I am indebted to Dr. C. C. Birchard, Chief Medical Officer of the Sun Life Assurance Company of Canada, for this information.

In a recent study of over one-half million insured lives, the New York Life Insurance Company has shown that the normal blood pressure is lower than is generally realized. For all ages to age 70, it is below 140 mm. Hg. A systolic pressure of 10 mm. Hg above the average for the age gave an excess mortality of 15 per cent; and a systolic pressure of 25 mm. Hg above the average for the age gave an excess mortality of 45 per cent.

it, when either blood pressure or size of the heart was the only suggestive abnormality, that there was no cardio-vascular disease. When both suggestive abnormalities were found in the same individual, the latter was classified as "cardio-vascular."

A brief note is also necessary here with regard to the fundi. As stated, this method of examination was dealt with separately. It was not included in the ordinary clinical procedures for the following reasons:

Though there is general agreement about the changes in the vessels in advanced vascular disease, there appear to be differences of opinion about early changes. As, in the initial stages, these are no more than exaggerations of the normal appearance, different interpretation by different individuals is only to be expected. This applies particularly to such early changes as congestion; increased diameter of veins; alteration of light reflex, and tortuosity of arteries. For uniformity of data, therefore, all examinations in this study were made by the same individual (S. H. McK.). The criteria were as follows:

Vascular Changes in the Fundus. Alterations in the vessels of the fundi affect both veins and arteries. The first sign observed is a general congestion of the veins which results in an increase of their diameter and a broadening of their light reflex. Next these veins, being made longer by congestion, show bending in the direction of the artery and this bending may be considered a first step in the development of venous tortuosity. Slightly later the phenomenon of disappearance of the vein at the point of intersection with an artery is observed. The vein is invisible, not only directly under the artery, but also for a short distance to either side. This is not necessarily a pressure effect; later a condition is seen in which pressure is definitely evidenced by slight dilatation of the veins just before the artery is reached. A further change in the veins consists of what is called bridging or banking, where the veins are seen to arch over or under the artery, in a more direct transverse axis, a letter Z formation. The final variety of venous change is tortuosity due to increased resistance to venous drainage.

Arterial changes, which usually are observed later, consist of calibre variation, tortuosity, alterations in the light reflex and pressure effects. The changes in calibre may be uneven and patchy in distribution or there may be a uniform narrowing, giving pale threadlike vessels. In some instances the vascular changes may result in regular interruptions of the light reflex without altering the column of blood, a condition which causes a beaded appearance of the artery. The degree of tortuosity of the arteries is very variable; the tendency to small cork-screw arteries in the macular area is important. The changes in light reflex give rise to the appearances known as copper-wire arteries, silver wire arteries, etc.

Retinal hemorrhages and exudates may both result from vascular changes. Evans⁹ believes that a certain type of retinal exudate is definitely associated with arteriosclerosis. It is of a dull yellow color variously distributed; one common situation is the margin of the disc.

The optic disc in retinal arteriosclerosis is usually not much affected until the late states. In advanced degrees of retinal arteriosclerosis there is evidence of a characteristic waxy pallor of the disc due to ischemia.

RESULTS OF INVESTIGATION

In table 2 are recorded the incidences of cardio-vascular disease according to the method of examination. It will be observed that the highest incidence was found with the ordinary clinical method. The limited significance, however, which can be attached to any one procedure alone is clearly shown in tables 3, 4, 5 and 6. In these tables, vascular disease is related to age. It will be observed that, according to roentgen-ray examination of the size of the heart (table 3) very few individuals under the age of 50 years had vascular disease; among 436 patients it was found in 46—an incidence of 10.5 per cent only; it was practically absent at the age of 30 years and under, and entirely absent at the age of 20 years and under.

TABLE II
Incidences of Cardio-Vascular Disease among 1500 Diabetics According to Method of Diagnosis

Method of Examination	Number of Examinations	Cardio-Vascular Disease	
		Number	Per Cent
Clinical*	926	378	40.8
Fundi	984	365	37.1
X-Ray of feet	858	262	30.5
X-Ray of heart	1004	182	18.1

* Cases in which blood pressure and heart measurement data were not recorded in detail were not included in this investigation.

According to calcification of the vessels of the lower extremities (table 4) the findings were practically the same; of 400 individuals of age 50 years and under, vascular disease was detected in 57 cases only—an incidence of 14.2 per cent only, and among 66 individuals of 30 years of age and under, it was detected in two cases only—an incidence of 3 per cent.

TABLE III
Age Incidence of Vascular Disease According to X-Ray Examination of Size of Heart in 1004 Diabetics

Age Period	Total Number	Vascular Disease	
		Number	Per Cent
-10	9	—	—
11-20	26	—	—
21-30	74	2	2.7
31-40	130	8	6.1
41-50	197	36	18.2
51-60	281	57	20.2
61-70	229	61	26.6
71-80	57	18	31.5
81+	1	—	—
	1004	182	18.1
Summary:			
30 years and under	109	2	1.8
50 " " "	436	46	10.5
Over 50 years	568	136	23.9

That roentgenological examination alone was not sufficient to determine the incidence of vascular disease in the group of individuals investigated is shown in the remaining tables. According to the fundi (table 5) among 537 individuals of 50 years and under, there were 111 cases, an incidence

TABLE IV

Age Incidence of Vascular Disease According to Calcification of Vessels in the Lower Extremities in 858 Diabetics

Age Period	Total Number	Calcification	
		Number	Per Cent
-10	5	—	—
11-20	16	—	—
21-30	45	2	4.4
31-40	150	11	7.3
41-50	184	44	23.9
51-60	221	97	43.8
61-70	196	89	46.2
71-80	40	18	45.0
81+	1	1	—
	858	262	30.5
Summary:			
30 years and under	66	2	3.0
50 " " "	400	57	14.2
Over 50 years	458	205	44.7

of 20.6 per cent, and among 69 individuals 30 years of age and under, there were 9 cases, an incidence of 13 per cent. According to ordinary clinical examination, the results were essentially the same. This is shown in table 6.

Do the above findings reflect the conditions which obtain among diabetics? That they do not, is shown in table 7. In this table are recorded

TABLE V

Age Incidence of Vascular Disease According to Examination of Ocular Vessels (Fundi) in 984 Diabetics

Age Period	Total Number	Vascular Disease	
		Number	Per Cent
-10	6	—	—
11-20	19	3	15.8
21-30	44	6	13.6
31-40	192	16	8.3
41-50	276	86	31.1
51-60	252	128	50.7
61-70	146	87	59.6
71-80	48	38	79.1
81+	1	—	—
	984	365	37.1
Summary:			
30 years and under	69	9	13.0
50 " " "	537	111	20.6
Over 50 years	447	254	55.8

the incidences of cardio-vascular disease according to *combinations* of two methods. With four methods taken two at a time, six such combinations are possible. By comparing tables 2 and 7, it will be observed that with

TABLE VI
Age Incidence of Vascular Disease According to Clinical Examination (Excluding Fundi)
among 926 Diabetics

Age Period	Total Number	Vascular Disease	
		Number	Per Cent
-10	5	—	—
11-20	28	4	14.3
21-30	66	6	9.1
31-40	136	7	5.1
41-50	176	47	21.0
51-60	258	133	51.5
61-70	213	145	68.0
71-80	44	36	82.2
81+			
	926	378	40.8
Summary:			
30 years and under	99	10	10.1
50 " " "	411	64	15.6
Over 50 years	515	314	60.9

any combination of two methods, the incidence of vascular disease was higher than with any one method alone (table 2). By combining three methods at a time, the incidence was further increased (table 8) and when all four methods were combined the incidence was highest. Among 500 individuals so examined vascular disease was found in 313 cases, an incidence of 62.6 per cent. That this incidence approaches the true conditions which obtain among these diabetics is suggested from tables 9 and 10; the incidences noted clinically approach those which have been found by careful postmortem examination. According to table 9, approximately 55 per cent of our diabetics of 50 years of age and under had vascular disease. Table 10 is a reproduction of table 26 of Shields Warren's "Pathology of Diabetes Mellitus."⁵ According to Warren, of 108 individuals of age 50 years and under, arteriosclerosis was found in 71 cases, an

TABLE VII
Incidences of Cardio-Vascular Disease among 1500 Diabetics According to Combination of Two Methods of Diagnosis

Method of Examination	Number of Examinations	Cardio-Vascular Disease	
		Number	Per Cent
Fundi and x-ray of feet	739	334	45.2
Fundi and clinical	662	332	50.1
Fundi and x-ray of heart	886	399	45.0
Clinical and x-ray of feet	737	391	53.0
Clinical and x-ray of heart	682	282	41.3
X-Ray of feet and x-ray of heart	760	348	45.8

incidence of approximately 66 per cent. It should be noted, as Warren points out, that the great majority of the individuals in this age group did not die of arteriosclerosis; this condition was the cause of death in seven cases only.

TABLE VIII

Incidences of Cardio-Vascular Disease among 1500 Diabetics According to Combination of Three Methods of Diagnosis

Method of Examination	Number of Examinations	Cardio-Vascular Disease	
		Number	Per Cent
Fundi, clinical and x-ray of feet	620	346	55.8
Fundi, clinical and x-ray of heart	564	341	60.5
Fundi, x-ray of feet and x-ray of heart	642	367	57.2
Clinical, x-ray of feet and x-ray of heart	640	357	55.8

TABLE IX

Incidences of Cardio-Vascular Disease among 500 Diabetics According to Age

Age Period	Number	Cardio-Vascular Disease	
		Number	Per Cent
-10	4		
11-20	14	4	28.6
21-30	34	5	14.7
31-40	67	33	49.2
41-50	124	91	73.3*
51-60	158	106	67.1
61-70	80	59	73.7
71-80	18	14	77.8
81+	1	1	—
	500	313	62.6

* Note: Among 243 individuals of 50 years of age and under, cardio-vascular disease was found in 133—an incidence of 54.7 per cent.

TABLE X

Postmortem Incidences of Arteriosclerosis *

Age at Death (Yrs.)	Number of Cases	Incidence of Arterio-sclerosis	Age at Death (Yrs.)	Number of Cases	Incidence of Arterio-sclerosis
-10	9	0	51-60	66	65
11-20	23	7	61-70	65	65
21-30	19	10	71-80	19	19
31-40	21	19	81+	2	2
41-50	36	35†	?	4	3
			Total	264	225 (85.2%)

* Taken from Table 26, "Pathology of Diabetes Mellitus," Shields Warren.

† Among 108 individuals of 50 years of age and under, arteriosclerosis was found in 71—an incidence of 65.7 per cent.

INFLUENCE OF THE DURATION OF THE DIABETES

In view of the satisfactory diagnosis when all four methods of examination are combined, it was considered advisable to reexamine the alleged relationship between duration of diabetes and cardio-vascular disease. For this purpose, the 500 cases shown in table 9 were studied. Cardio-vascular disease was related not only to age, but also to duration of diabetes. The combined data are shown in table 11.

TABLE XI
Relationship between Cardio-Vascular Disease, Age and Duration of Diabetes among 500 Diabetics

Age Period	Duration of Diabetes					
	5 Years and Over			Under 5 Years		
	Total Number	Cardio-Vascular Disease		Total Number	Cardio-Vascular Disease	
		Number	Per Cent		Number	Per Cent
-10				4		
11-20	2	2	100.0	12	2	16.7
21-30	4	2	50.0	30	3	10.0
31-40	21	18	85.7	46	15	32.6
41-50	54	47	87.0	70	44	62.8
51-60	50	43	86.0	108	63	58.3
61-70	12	8	66.7	68	51	75.0
71-80	1	1	100.0	17	14	82.3
81+				1	1	100.0

It will be observed that in the majority of these 500 cases, namely, 356 (71.2 per cent) there was a history of diabetes of less than five years and, among these 356 cases, cardio-vascular disease was found in 193, an incidence of approximately 55 per cent. In accord with past experiences, a high incidence of vascular disease is expected when the disease is of more than five years' duration; but this high incidence was not suspected when the duration of the disease was less than five years. This emphasizes the value of the *combined* method of examination. It will also be observed in this table that of 162 individuals of 50 years of age and under who had diabetes for five years or less, vascular disease was found in 64 cases—an incidence of approximately 39 per cent.

That this high incidence of vascular disease among individuals of 50 years of age and under and with the disease of less than five years' duration would be discovered by the combined method of diagnosis only is suggested from the following:

In table 7 of a report in 1930 Joslin¹⁰ records the incidence of calcification of arteries according to the ages of the individuals and durations of diabetes in 298 cases. The incidences are expressed as percentages. The 298 individuals are divided into 40 groups. In the majority of cases, therefore, the number in each group was small—less than 10 cases. Since limited significance can be attached to findings with such small groups, and

in order that Joslin's findings may be comparable with our own, we have converted Joslin's percentages into actual number of cases and divided the 298 individuals into three groups only according to age and two groups only according to duration of diabetes. The combined data are summarized in table 12.

TABLE XII

Comparative Data Showing Relationship between Cardio-Vascular Disease, Age and Duration of Diabetes

Age Group	Under 5 Years Duration			Over 5 Years Duration		
	No.	Cardio-Vascular Disease		No.	Cardio-Vascular Disease	
		Number	Per Cent		Number	Per Cent
Whole*	103	52	50.5	195	131	67.2
50 years and under	52	8	15.4	145	83	57.2
Over 50 years	51	44	86.3	50	48	96.0

* Calculated from x-ray data, Table 7, ANN. INT. MED., 1930, iv, 54, E. P. JOSLIN (298 cases).

Age Group	Under 5 Years Duration			Over 5 Years Duration		
	No.	Cardio-Vascular Disease		No.	Cardio-Vascular Disease	
		Number	Per Cent		Number	Per Cent
Whole†	356	193	54.2	144	121	84.0
50 years and under	162	64	39.5	81	69	85.2
Over 50 years	194	129	66.5	63	52	82.5

† The Montreal General Hospital data (500 cases). All methods of diagnosis used.

It will be observed that, regardless of duration of diabetes, the incidence of vascular disease was much higher according to the combined method of examination than when diagnosis was based upon roentgenological examination alone. In Joslin's group of cases, 15.4 per cent only of the individuals of 50 years of age and under had vascular disease, when the duration of the diabetes was less than five years; whereas, in our group, the incidence for the corresponding group was 39.5 per cent. When the duration of the diabetes was more than five years, again, our incidence was higher than that recorded by Joslin for the younger age groups, namely, 85.2 per cent compared with 57.2 per cent.

That our data reflect the true conditions which obtain among diabetics in general is again supported by postmortem data. The observations of Warren,⁵ who has made a special study of the pathology of diabetes, are worthy of note here. "I have yet to see at autopsy a diabetic, or to read the autopsy protocol of a diabetic, whose disease has lasted five years or more, free from arteriosclerosis, regardless of age."

SUMMARY

The purpose of this report is to emphasize the high incidence of vascular disease in diabetes mellitus.

The cause of this high incidence is, as yet, unknown.

Aside from etiology, for the prevention and successful treatment of vascular disease, early diagnosis is essential. The above data indicate that by a combination of the methods investigated vascular disease is more readily detected than by the use of any one method to the exclusion of all others; the incidence of vascular disease found during life approaches that found on careful postmortem examination.

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TULAREMIC PNEUMONIA *

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UNTIL recently many observers have considered the presence of pneumonia in cases of tularemia as an intercurrent infection. Several published necropsy reports refer to more or less extensive bronchopneumonia without directly attributing it to the tularemic infection.

Permar and MacLachlan,¹ in reviewing the reported fatal cases, found that 36 per cent showed pneumonia either clinically or at autopsy and that in 62.5 per cent of the autopsied cases there was diffuse pneumonic involvement. In correlating the pathological reports in published cases with their own observations they believe that tularemic pneumonia presents morphologic changes which are specific for tularemia. These morphologic changes are the typical miliary necrotic focal lesion, extreme subendothelial edema and mononuclear cellular infiltration in the blood vessels. The edema in the arterioles and venules produces a narrowing in the lumina of the vessels, which is followed by thrombosis. It is this thrombosis with the resulting vascular obstruction which accounts for the widespread necrosis present in these cases. This necrosis, which is usually progressive, indicates a grave prognosis.²

It is certain that many cases with minimal pulmonary involvement recover³ and that some pneumonias do not go on to a fatal outcome, as evidenced by the case reported recently by Tureen⁴ in which complete recovery occurred.

We have recently observed a case which closely parallels that reported by Tureen and in which complete recovery likewise occurred:

CASE REPORT

A mechanic, aged 37 years, was admitted to St. Mary's Hospital on September 22, 1932 under the care of Dr. Anthony J. Bianco, who had been called to see the patient at his home that same day.

The complaints on admission were chills, fever, headache, general malaise, extreme exhaustion, left sided chest pains, dyspnea and cough. He had been taken suddenly ill four days previously with chills, fever, headache and generalized aches and pains. The day following, a slight unproductive cough had developed and this became progressively worse during the next two days, during which time chest pain and dyspnea also appeared.

At the time of admission to the hospital the cough was severe and prostration was marked. His temperature was 104.8° by rectum, pulse rate 116 and respiratory rate 30. Chest examination showed moderate dullness over the base of the left lung posteriorly and moist inspiratory râles were heard over this same area. A roentgenogram of the chest showed a small area of infiltration in the lower left lobe. The white blood count was 6000. A diagnosis of lobar pneumonia was made and treatment instituted on this basis.

* Read before the Minnesota Society of Internal Medicine, May 15, 1933.
From The Duluth Clinic and St. Mary's Hospital.

On the next day he was definitely worse: prostration had increased, diaphoresis was marked, the cough was severe and he was raising blood stained sputum. The chest pain and headache continued. The temperature rose to 105.4° (R.). The

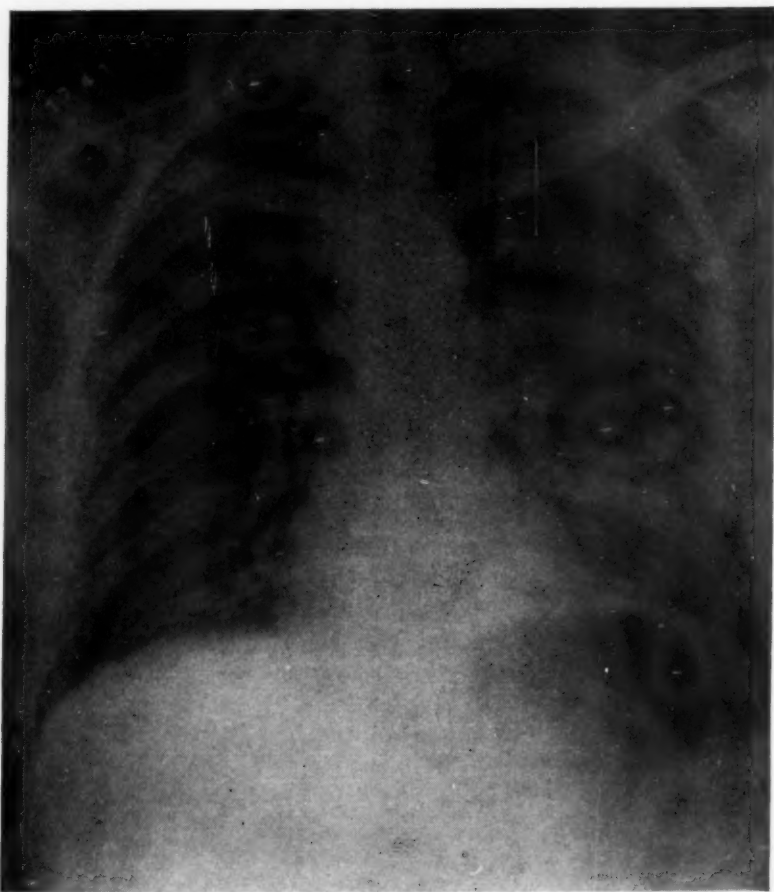


FIG. 1. Roentgenogram of chest on the fourth day of illness, showing moderate involvement of the lower lobe of left lung.

dullness over the left base was increased and bronchial breathing was noted in addition to the inspiratory râles.

On the ninth day of his illness his condition appeared about the same except that cyanosis was present. He was still coughing severely and raising the blood stained sputum. Respirations were more rapid and shallow. Chest examination indicated the presence of a pleural effusion on the left side. The white blood count was 5000, polymorphonuclears 69 per cent, lymphocytes 30 per cent, monocytes 1 per cent. On the next day 600 c.c. of fluid were removed from the left pleural cavity. This showed a white blood count of 1777 and a red blood count of 8200. No microorganisms were found on direct smear and a culture was later reported as negative.

His condition progressively became worse. He appeared to be very toxic, cyanosis increased to a marked degree, and delirium developed. Continuous use of oxygen gave considerable relief and a second thoracentesis was performed.

At this time blood was sent to the Minnesota State Laboratory for agglutination tests because the prostration and toxicity appeared to be out of proportion to the pulmonary involvement. On October 4, 1932 the report from the Minnesota State Laboratory stated that there was complete agglutination of the blood serum with *B. tularensis* in 1:80 dilutions and partial agglutination in 1:160 dilutions. Agglutination was absent with *Brucella melitensis* and *B. typhosus* and *paratyphosus*.

On receiving this report a careful search for a primary lesion and lymph gland

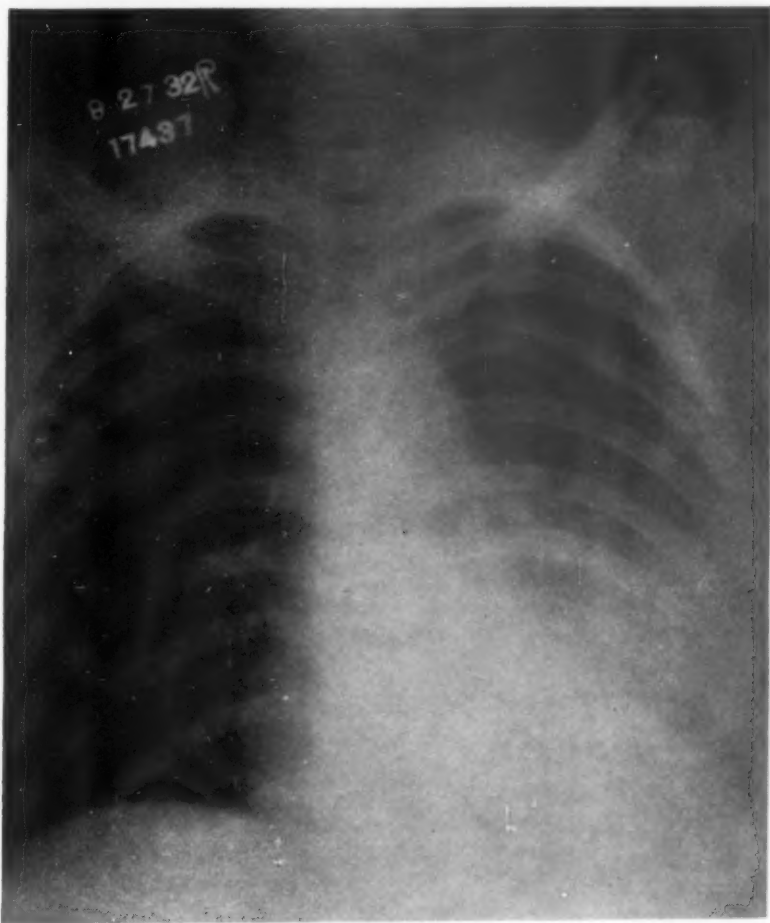


FIG. 2. Roentgenogram taken on the ninth day of illness, showing extension of pathologic process in lower left lobe.

involvement was made but none was found. The patient was irrational and could not give any history of exposure, but his wife stated that he had skinned a rabbit four days before the onset of his illness. (The patient later stated that just before skinning the rabbit he had squeezed a pimple on the median side of the right anterior nares and that while he was skinning the rabbit he wiped the secretion from his nose with his hand. He apparently infected himself through the open sore in his nostril. The nose was sore for several days following this, but he thought that he had a small boil.)

A second blood specimen was sent to the Minnesota State Laboratory on October 7, 1932 and this showed that agglutination was present with *B. tularensis* antigen in dilutions of 1:1280. A definite diagnosis of tularemia and tularemic pneumonia with pleural involvement was now made.

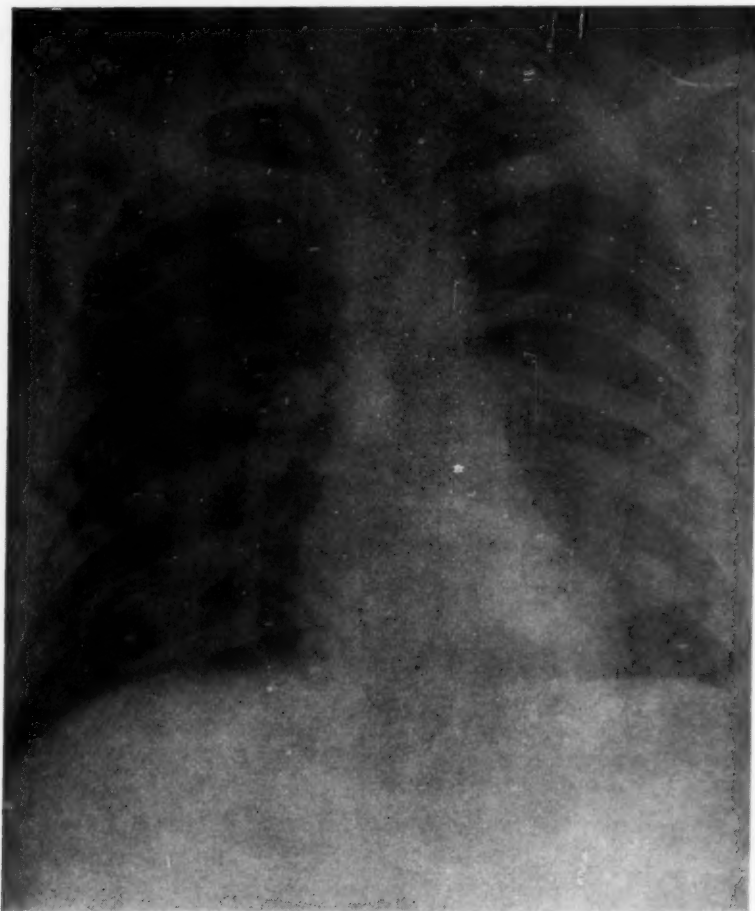


FIG. 3. Appearance of lungs at the end of the seventh week of illness.

On the seventeenth day of his illness the temperature, which had ranged from 102° to 105.4° (R.), began to drop and a gradual improvement was noted. On the thirty-fifth day his temperature was normal and he was transferred to his home to continue his convalescence. At this time he noticed several small pustules on the skin of his body and these persisted for three weeks. A direct smear showed gram-positive diplococci, which were lancet-shaped.

His convalescence was slow, and six weeks after his return home he was able to walk only a short distance without experiencing fatigue and dyspnea. He was able to return to work during the middle of March of 1933—six months after the onset of his illness. He is now in excellent health and shows no evidence of his illness, except that on May 12, 1933 the blood serum showed agglutination with the *B. tularensis*

antigen in dilutions of 1:1280. Agglutination was absent when tested with *Br. melitensis*, *B. typhosus* and *paratyphosus*.

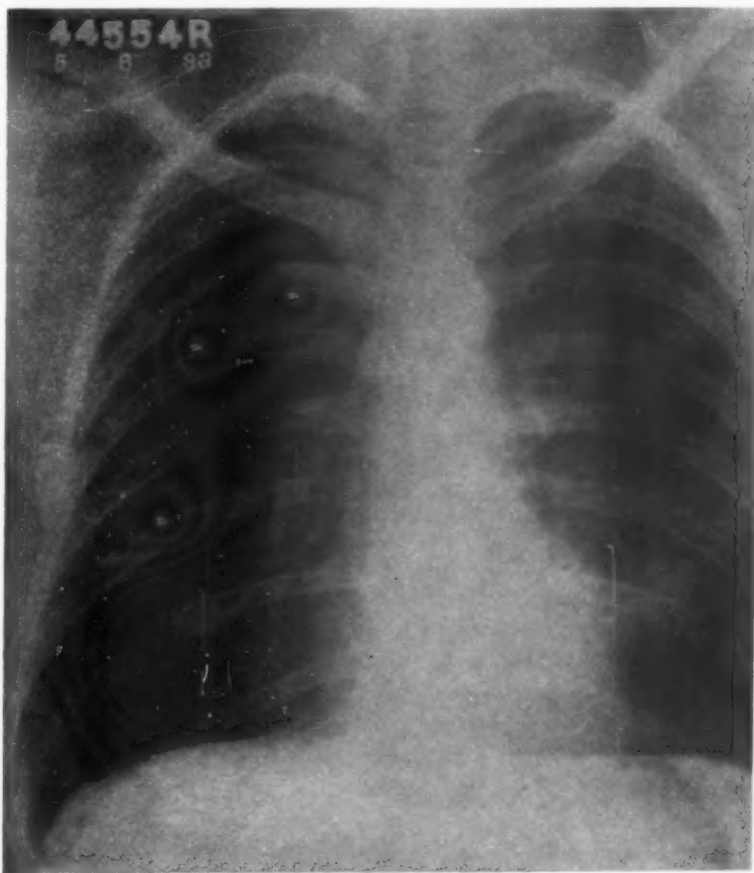


FIG. 4. Normal roentgenogram obtained eight months after onset of illness.

This case is of interest because it presents an instance of severe tularemic pneumonia which resulted in complete recovery after a prolonged convalescence; and also because of the unusual mode of infection.

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DEVELOPMENTS AND DISAPPOINTMENTS IN BLOOD STUDIES *

By ROGER I. LEE, M.D., F.A.C.P., *Boston, Massachusetts*

SOMEWHAT over a medical generation ago, or at the beginning of the present century, the study of blood entered on what seemed to be a remarkably promising era. Hitherto, careful and exact studies of organs and tissues had been carried out largely after death. However, the advances in surgery were encouraging the development of a living pathology in contrast to a postmortem pathology. The internist was eager to study at the bedside the beginnings of disease, rather than to confine his attention to the study of end results in the autopsy room. The possibilities of living studies were obvious and far-reaching in diagnosis, prognosis and treatment, and perhaps the most alluring tissue for such study was the blood, which touched every part of the body, and on which indeed life itself depended.

Up to this time the clinician had the thermometer as his usual instrument of precision, his stethoscope as an assisting mechanical device, and the examination of the urine as his important clinical laboratory test. There had already been developed to a considerable extent the numerical and the morphological study of the formed elements of the blood. The anemias and the leukemias were recognized as blood diseases in which the diagnosis could be best made by the examination of the blood. In his picture of the possible development of studies of the blood, the clinician looked forward to the collection of data concerning the living patient, which would in connection with his clinical ability and the already developed pathological postmortem experience furnish accurate and complete diagnosis and prognosis and rational and precise treatment, with possible and even probable cure of most diseases.

The development of a technic in immunology—of which the common illustration was the agglutination reaction for the typhoid bacilli—gave high hopes for the value of blood studies in immunology. The so-called Widal reaction stood up nobly under the acid test of experience and there seemed to be no reason why similar methods might not prove applicable to many, if not all, of the infectious diseases in which the causative organism could be isolated and grown on artificial media. At the same time that the agglutination and other antibody reactions were being studied, the technic of cultures was being developed, and it was confidently predicted that by the examination of the blood by blood cultures and by the reactions of the serum and of the formed elements of the blood, the precise diagnosis of nearly all, if not all, infectious diseases would be attained.

A little later perhaps, but essentially simultaneously, studies in blood chemistry were being pushed and it seemed reasonable to expect that the

* Read before the American College of Physicians, Chicago, April 16, 1934.

analysis of a specimen of blood could detect not only such recognized diseases as nephritis, diabetes, gout, and the like, but also the exact chemical status of the body. It seemed probable at that time that studies of the blood would solve many of the mysteries in regard to metabolism. There was much speculation as to a possible precise correlation between the chemical analysis of the blood and diet. Possibly if some important constituent were lacking, that deficiency might be supplied directly to the blood, if simpler methods were ineffective.

As one looks in retrospect upon these very active and indeed very fruitful years, one finds that the optimistic hopes of a generation ago are far from being fulfilled. As we survey the advances in what might be called morphological studies, we find that we have a larger and considerably clearer conception of the so-called formed elements of the blood. But this is amplification of knowledge that, in the main already existed rather than important discoveries. This is even true of the blood platelets which are now recognized as separate entities, and it is generally accepted, I think, how the blood platelets are formed and the usefulness of the blood platelets in the promotion of coagulation and in clot retraction. Studies along these lines have given us a far better concept of many of the recognized blood diseases and have established the identity of certain conditions associated with a low number of blood platelets such as thrombopenic purpura. That the blood platelets are normal morphologically but function in an abnormal fashion in hemophilia, is slowly gaining credence. Dr. W. H. Howell, at the Baltimore meeting of the American College of Physicians, stated his present leaning toward that theory after many years of study of hemophilia.

Hematological studies have brought into our ken such disorders as sickle-celled anemia and granulopenia. The hemolytic anemias have been clarified. The definite establishment of blood groups, even if all the refinements of the problem are by no means elucidated as yet, has given to the clinician the necessary safeguards in employing transfusion as a therapeutic procedure. Certainly blood transfusion stands out clearly as a definite product of blood studies during this period. Furthermore, in order to establish the rôle of blood transfusion as a safe therapeutic procedure, not only were studies of compatibility in regard to red corpuscles and sera necessary, but also studies in regard to blood coagulation, blood volume and other aspects were almost equally important. In addition, all these studies of the various factors which make for safe blood transfusion have vastly helped our understanding of the blood as a whole, as well as the fundamental interrelation of red blood corpuscles and the blood plasma or blood serum. As an illustration of a development out of the study of these factors, mention may be made of the determination of the sedimentation rate of the red corpuscles. The variations of this rate depend upon alterations in the normal interrelation of red corpuscles and plasma.

I would be far from decrying any of the advances in microscopic hematology, and yet it must be admitted that, as a reward of a prodigious amount

of work, there has been with one great and glorious exception mostly a better understanding of certain clinical conditions already recognized rather than great discoveries. Of course, the great and glorious exception to which I refer is the demonstration of the successful control of pernicious anemia by the administration of liver or some kindred substance. It is important, I think, to appreciate the fact that this great discovery obviously and properly takes, by the very nature of the therapeutics, the disease long known as a primary blood disease quite out of that category and makes it a purely secondary blood disease. It is of interest in this connection, however, that the work which culminated in this startling demonstration was done by investigators who were concerning themselves almost exclusively with blood studies and who were trying to determine the effect of diet upon blood.

The studies of the white corpuscles of the blood, morphologically and otherwise, have been disappointing. Within limits we have increased our knowledge of the leukemias. But, as an example, we are still at as much loss concerning acute leukemia as we ever were. Has it any relation to the other leukemias anyway?

The leukocytic response to the various infections is perhaps held in lower esteem than it was 25 years ago. We accept without great excitement the general fact that certain infections usually but not always have a characteristic leukocytic response. Indeed one such infection is frequently called infectious mononucleosis. There are recurrent waves of interest in the fact that the responding polynuclear leukocytes may have the characteristics of youth or that under certain stimulations bizarre cells may be present in the blood stream. Of course these findings have some significance, but the significance is mild. The special study of the leukocytes by such methods as the opsonic index of Wright certainly has not given that wealth of information so confidently predicted early in this century.

In the field of bacteriology and immunology, the blood has been subjected to extremely intensive study. Our ability to grow microorganisms out of the blood has been, at least up to now, limited to only a few of the many infectious diseases and has been frankly disappointing. Of course when successful it is a procedure of great value. It may well be that our technic is at fault and that we await the advent of another Pasteur who will again combine intellectual genius and imagination with the technic of a true virtuoso in his field. Or it may be that the field of blood cultures has produced its harvest and there will be no important additional crops in the way of tangible results.

There have been many studies tending to demonstrate the activity of the blood and the organism in general in combatting the infectious diseases. It has been mostly the blood serum which has been subjected to this study and various important reactions have been determined. In some instances, the findings are not important from a diagnostic or an immediately applicable therapeutic view but are very important in the general concept of the

particular disease. Curiously enough, the best known of these serological tests is an adaptation of the complement fixation phenomenon. This was at one time considered to be a specific biological test for syphilis. It is indeed a most curious and most extraordinary fact that this test which became most famous as the Wassermann test is not in any sense a specific biological reaction at all. Even today, we do not know why the blood serum of syphilitic patients gives this type of reaction under the conditions of this test in such a remarkably accurate percentage. It is an interesting commentary that a whole generation should have passed and should have accepted the outstanding and obvious fact that the Wassermann test is such a valuable adjunct to medical practice and nevertheless should still have to grant that the underlying basis is quite unknown. However, the complement fixation phenomenon is used with satisfactory results in a modest number of infectious diseases. In these circumstances the test is essentially specific.

Disappointing as a good many of these studies have been in the production of specific and tangible clinical tests directed toward the infections and the body response to them, and however much we may point out the fact that the best known test is not a specific biological test but a pure accident, the underlying mechanism of which is unknown, nevertheless, in this field of immunology really very great advances have been made in our understanding of the complicated mechanism of the infectious diseases. The studies of the family of the streptococcus depend considerably upon a multitude of serological reactions in the human patient and in the experimental animal. Even if the retrospect shows much that is disappointing, and certainly the retrospect falls short of fulfilling even what was called a generation ago modest expectations, nevertheless, substantial progress has been made. And the end is not yet. Perhaps the future has in store some antibody reaction, possibly of a nature now unsuspected, which will give to the clinician his long awaited precision test in the infections.

The chemist, always interested in the blood, found great difficulty in getting an adequate amount of blood *in vivo* for chemical study until it was determined that blood could easily be obtained from the veins. Thereafter, the chemist busied himself with devising methods for the estimation and study of all sorts of chemical substances in the blood, with particular reference to those substances concerned in metabolism and its disturbances and in some of the common diseases. As I have indicated before, at one time it was thought that a careful chemical study of the blood would give us an exact picture of any individual, his metabolism and its disturbances, and might indeed represent an estimate of the efficiency of his total bodily functions. It was early found that the estimation of blood sugar was of very great importance in the diagnosis and control of diabetes and of any interference with sugar metabolism. Additional experience through the years has confirmed this test as highly satisfactory in clinical practice. The various tests for the determination of the different nitrogenous substances

in the blood have not proved quite so satisfactory. While it is true that in many cases of advanced renal disturbance one gets a high retention of certain nitrogenous substances in the blood, yet the determination of these substances is really of little importance in the early stages and, as might be expected also, a variety of conditions other than kidney damage often bring about an abnormally high reading of these nitrogenous substances in the blood. The single illustration of the effect of starvation upon the blood chemistry and particularly the nitrogenous substances will be sufficient to give my meaning. The determinations of the calcium and the phosphates in the blood have developed into important findings in certain rather restricted clinical conditions and the same is true of various other substances such as chlorides, etc. It was hoped at one time that the chemical examination of the blood might enable us to understand the mechanism of edema, particularly those forms of edema which are certainly in their general essence not mechanical. Curiously enough, there has been a bitter disappointment in studies along these lines and even after the exhibition of successful therapeutic agents the study of the blood during the actually enormous polyuria and the disappearance of edema has frequently shown no significant change chemically.

Certain rather more complicated studies of the blood, particularly those directed toward the study of the acid-base equilibrium of the blood and the variations therein, and the chemical studies of certain so-called buffer salts have been very helpful to our understanding of the fundamental physical and chemical changes which go on in the body and have had unquestionably a considerable influence upon our general knowledge of clinical conditions and indeed upon the general clinical attitude in therapeutics. Nevertheless, the extravagant hopes of extensive precise application of these studies to definite clinical problems have not been realized.

When, however, the blood studies have been directed toward the particular function of the blood of delivering oxygen to the tissues and removing carbon dioxide therefrom, and when these blood studies are combined with correlated studies of respiration and of the circulation, we find that very notable progress has been made in the fundamental physiology and secondarily in many clinical pictures. Upon this better understanding, definite therapeutic measures are clinically based. These studies have indicated that any interference with what might be called the hemodynamics, or in other words the circulation of the blood, is obviously just as serious as any interference with the content of the blood. These studies, furthermore, have indicated that the blood content, even in the very restricted sense of the amount of oxygen and carbon dioxide, is dependent upon such factors as altitude, atmospheric pressure, etc. Furthermore, any substantial deviation from the usual total volume of the blood is accompanied by marked interference of the capacity of the blood to perform its function in the gas exchange of oxygen and carbon dioxide.

Certainly, as one contemplates in retrospect these blood studies, morphological, serological, bacteriological, immunological, chemical, and physical, one must sense the fact that the outstanding function of the blood seems to be to act as the vehicle for the gas exchange of oxygen and carbon dioxide between the tissues and the outside atmosphere. In that sense the blood acts as a vehicle, and if there is interference with the load that it carries or with the vehicle itself, there is inevitably some disturbance. If one carries this thought further, one finds indeed that one can build up a satisfactory conception of the blood as a vehicle. For example, before the present era, the diagnosis of Bright's disease, or nephritis as we now call it, was made by very careful examination of the urine. With the advance in the technic of chemical blood studies, we have gotten one stage nearer the source of disturbance, but the blood chemistry does not reveal necessarily the whole picture. The disease is in certain organs and tissues. The actual disturbance is very largely in certain fixed cells. The blood merely acts as a vehicle which may or may not show the intensity of this disturbance. The intensity of this disturbance is reflected in the blood when the cells give off certain abnormal products if these products remain in the blood and can be chemically demonstrated. It is possible to assume that the cells might not give off abnormal products, although they were badly damaged, and indeed it is likely that the rate of output of these abnormal products does not precisely correspond with the degree of damage. Here again, the blood represents a vehicle or means of communication between the cell and the elimination from the body. Likewise, in bacteriological and immunological studies, bacteria may be present in the blood stream for possible destruction or elimination. This mechanism occurs in some diseases and does not occur in others. In some instances of infection, the antibodies seem to circulate freely in the blood; in others they seem to be fixed in the cells. There is as wide a variation in that aspect as there is in the appearance of a leukocytosis in one kind of infection, the appearance of a lymphocytosis in another, and of no demonstrable change in the formed elements of the blood in others. In other words, the blood may or may not show any alteration or any of the evidences of existing tissue disturbance. This may be true even though there be tissue reactions in the bone marrow, the lymph gland, or the more obscure tissue reaction of those cells which deal with the complicated production of some of the antibodies.

It would seem to me that if we accept the blood as a vehicle and indeed as hardly an organ of itself, it would tend to clarify our fundamental ideas in regard to blood as a tissue. We must grant the fact that even in diseases of the blood as pernicious anemia, now controlled even if not cured by diet, or in leukemia, which frequently can be controlled for some time by irradiation, and in which we may get a normal blood picture in the course of some infection, the blood may show at times essentially no deviation from normal. All this indicates that the blood is hardly a primary tissue in a somewhat

arbitrary sense. It is true that the blood is one step nearer the cell than the urine and often gives us unquestionably more information. Nevertheless, sometimes it may be technically simpler to discover clinically certain substances in the urine than it is in the blood—for example, the hormone of pregnancy. However, in the final analysis, the cells of the body are the real subjects of our study and it seems to me that we must assume that the blood is one step removed from the cells and that in all of our blood studies, we are not studying, with the exception of gas exchange and a few other things, the fundamental cell itself or its disturbance. Consequently, I believe that we should interpret all blood studies in this light and regard them mostly as indicators rather than actual positive fundamental facts of bodily disturbance. In that light, it seems to me that while we may have had many and bitter disappointments in our blood studies of the past generation, and while we must admit that we were far too optimistic in our hopes and predictions, and while we were at fault in hoping to find something which the studies themselves have shown could not have been present, nevertheless these blood studies have brought about a profound and fundamental clarification of many of the complicated mechanisms of the body and I hope have brought about a clearer concept of the blood itself and of the function of the blood.

Perhaps some virtuoso of technic, or better many virtuosos, may in the future develop some different angles in blood studies. It may be that some time the scrutiny of the blood will furnish precise indicators of cellular activity and of cellular disturbance. But our present knowledge leads us to assume that with the exception of the hemodynamic function of the blood, blood studies will be important as determining indications of functions and diseases rather than the actual functions and processes themselves.

MULTI-PLANE CHEST ELECTROCARDIOGRAPHY

A STANDARDIZED METHOD OF CHEST LEAD APPLICATIONS *

By JOSEPH WEINSTEIN, M.D., *Brooklyn, New York*

SINCE the introduction of the string galvanometer by Einthoven¹ in 1903, and the perfection of the modern electrocardiograph, a multitude of experiments were conducted to determine the most suitable points for the application of the electrodes, with the final acceptance of the three limb "leads" now universally adopted. The electrocardiograms thus produced have proved of invaluable assistance to the clinician in the study of cardiac irregularities and affections of the myocardium.

That this method has its limitations has been shown by the frequent occurrence of proved cases of coronary vessel occlusions where normal electrocardiograms were obtained. The reason is that the three standard leads represent a single plane and will, therefore, fail to record changes in the muscle action current in "silent areas" of the heart muscle which travel in a different axis.

Lewis² in 1909 first observed the advantage of an antero-posterior chest lead in his observations on the auricular action in fibrillation. In 1932 Wolferth and Wood^{3,4} definitely established the advantage of an antero-posterior chest lead (which they called "Lead IV") in cases of coronary occlusion. Similar findings were observed by Lieberman and Liberson,⁵ Katz and Kissin,⁶ and others.

Wood and Wolferth⁷ observed, in cases of experimentally produced coronary occlusions in dogs, that the electrocardiogram produced by a single antero-posterior lead may fail to show the presence of the myocardial change when other chest leads, where the electrodes are applied to the surface of the body in the proper locations, will definitely demonstrate the lesion. They also noted that the maximum changes were observed in the leads applied nearest the lesion. Hoffman and Delong⁸ demonstrated clinically the advantage of using several antero-posterior chest leads placed at arbitrarily selected points, having observed that the lesion may be detected on one or two of these leads and not on any of the others.

These observations indicate the necessity of a wider range of accurately standardized application of chest lead take-offs. The method which I propose will, I believe, not only detect more readily changes in all "silent areas" of the myocardium, but will also give a better index as to the location of the lesion. With the use of long electrodes, applied as in figures 1 and 2, the heart is surrounded and intersected by "planes" of action current take-off.

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From the Medical Service of the Jewish Hospital of Brooklyn.

TECHNIC

The right and left arm electrodes are used for the chest application and they are so placed that the current take-off is kept in the same relationship to the current direction within the heart as in the three standard limb leads. Figure 3 illustrates (as presented by Pardee⁹) the relation of the current direction within the heart to that obtained by the right and left arm electrodes as applied in Lead I. The right arm electrode is, therefore, always

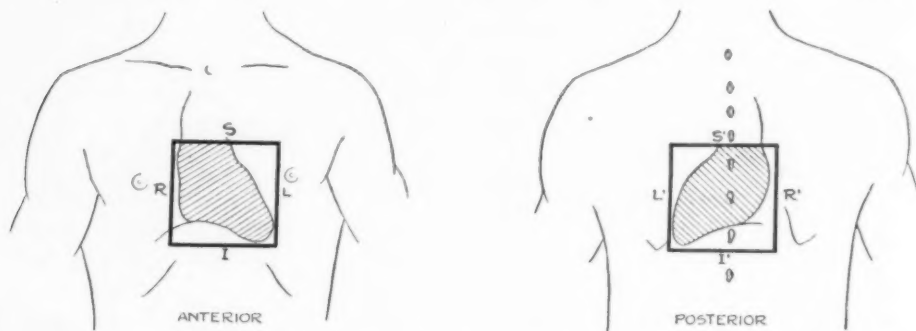


FIG. 1. Illustration of the positions for the application of the electrodes. Their length and location are dependent on the size of the heart.

On the anterior chest wall: *R* is a vertical line at the right border of the heart extending from about the level of the right chondrosternal junction downward. *L* is a vertical line at the left border of the heart at the same level as *R*. *S* is a horizontal line at the superior border of the heart extending from the upper end of *R* to the upper end of *L*. *I* is a horizontal line at the inferior border of the heart extending from the lower end of *R* to the lower end of *L*.

On the posterior chest wall: Positions *R'*, *L'*, *S'* and *I'* are determined by the extension of positions *R*, *L*, *S* and *I* directly posteriorly to the posterior chest wall.

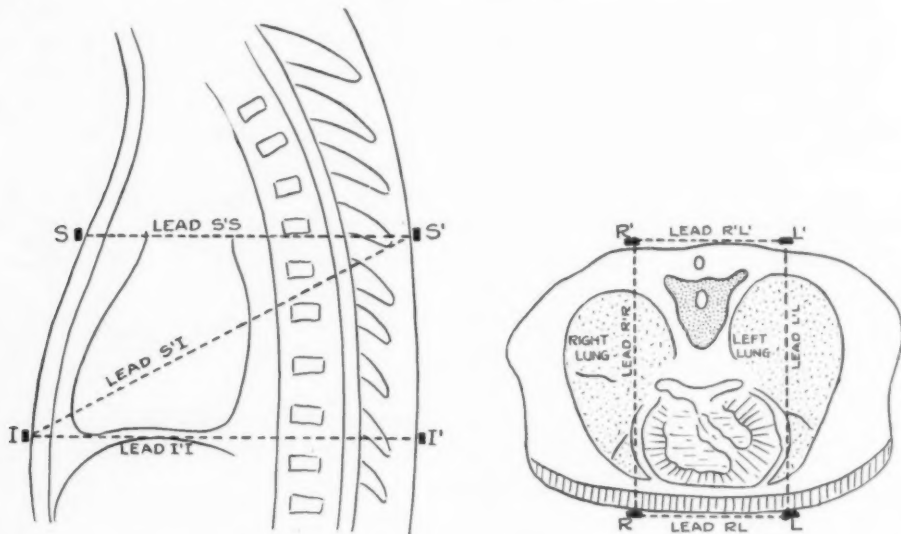


FIG. 2. Lateral and cross section views of the chest illustrating the positions for the application of the electrodes.

applied to the chest in closest relation to the tail of the arrow, while the left arm electrode is applied in closest relation to the head of the arrow representing the heart action current direction.

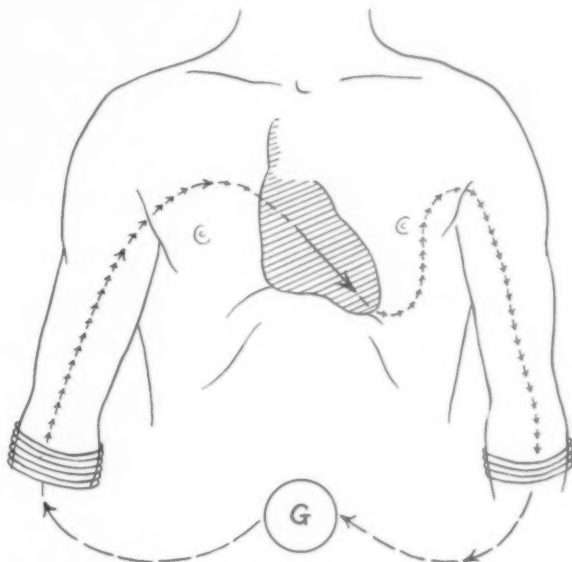


FIG. 3. (As illustrated by Pardee.⁹) Diagram showing the relation of the current within the heart to that obtained by Lead I. The line of arrow heads passing through the body from right arm to left arm represents the flow of current in Lead I, and the circuit is completed outside the body through the galvanometer as indicated by the long dotted arrows between the two arms.

It is important accurately to determine the size of the heart and the position of the cardiac borders either by a teleroentgenogram, fluoroscopic methods, or by as accurate percussion as is possible.

Flexible electrodes, $\frac{1}{2}$ inch wide and from four to six or more inches in length, depending on the size of the heart, are used. The electrodes should be covered with gauze soaked in warm saline solution. The skin at the sites selected is cleansed with an antiseptic solution, and linear scarifications, the length of the electrodes used, are made. The electrodes are held firmly in place either by an assistant whose hands are insulated with rubber gloves or, preferably, by a spring clamp device. The skin resistance should be carefully standardized before each lead is taken.

The electrodes are applied to the positions on the chest wall as illustrated in figures 1 and 2.

Leads	Right Arm Electrode Applied to Position	Left Arm Electrode Applied to Position
R'R	R'	R
L'L	L'	L
RL	R	L
R'L'	R'	L'
S'S	S'	S
I'I	I'	I
S'I	S'	I

RESULTS

Normal Controls

A study of 50 normal cases gave strikingly uniform tracings on all the multi-plane chest leads. Figure 4 illustrates three normal cases taken from this group. Both the standard limb leads and the multi-plane chest leads are shown. The time element remains the same as on the standard limb leads. An analysis of the normal multi-plane chest leads reveals the following:

Lead R'R—A low upright or biphasic P-wave, a prominent S- and a low upright T-wave.

Lead L'L—A low or iso-electric P-wave, a biphasic QRS, and an upright symmetrical T-wave.

Lead RL—A low upright P-wave, a prominent R- and a low S-, upright symmetrical T-wave.

Lead R'L'—A low upright P-wave, a prominent R- and a low symmetrical T-wave.

Lead S'S—A low upright or biphasic P-wave, a prominent S- and a low upright T-wave.

Lead I'I—An upright P-wave, biphasic QRS of high amplitude, and a very high symmetrical T-wave measuring from 5 to 10 mm. in height.

Lead S'I—A prominent upright P-wave, a biphasic QRS of high amplitude, a very high symmetrical T-wave measuring from 5 to 10 mm. in height. A prominent U-wave is frequently observed on this lead.

Cases Presenting Abnormal Multi-Plane Chest Leads

The following patients, although showing comparatively normal tracings in the three standard limb leads, presented definite abnormalities in the multi-plane chest lead tracings.

Case 5 (figure 5), a young male, 30 years of age, gave absolutely no symptoms referable to his cardio-vascular system. The physical examination was entirely negative. The standard limb lead tracings showed no abnormalities other than a slight (0.5 mm.) elevation of the RT transition of Lead II. However, the multi-plane chest leads showed a definite inversion of the P- and T-waves on Leads R'R and S'S, a 1.5 mm. elevation of the RT transition above the iso-electric line on Lead L'L and a saddling and 2.5 mm. elevation of the RT transition above the iso-electric line on Leads I'I and S'I. A careful review of the past history of the patient revealed the fact that a few months previously he had had an influenzal bronchopneumonia which was followed by a toxic exhaustive state which lasted about three weeks.

Case 26 (figure 5), a male, 55 years of age, with a history of hypertension of many years' duration, had been complaining for the past three months of attacks of severe precordial pain, lasting as long as half an hour, coming on with slight exertion and requiring absolute rest for relief. The standard limb leads, in this case, also showed relatively normal tracings with the exception of a left ventricular preponderance; but the multi-plane chest leads showed an inversion of the P- and T-waves in Leads R'R and S'S, a 1 mm. elevation of the RT take-off on Lead L'L and a saddling and a 3 mm. elevation of the RT transition above the iso-electric line on Leads I'I

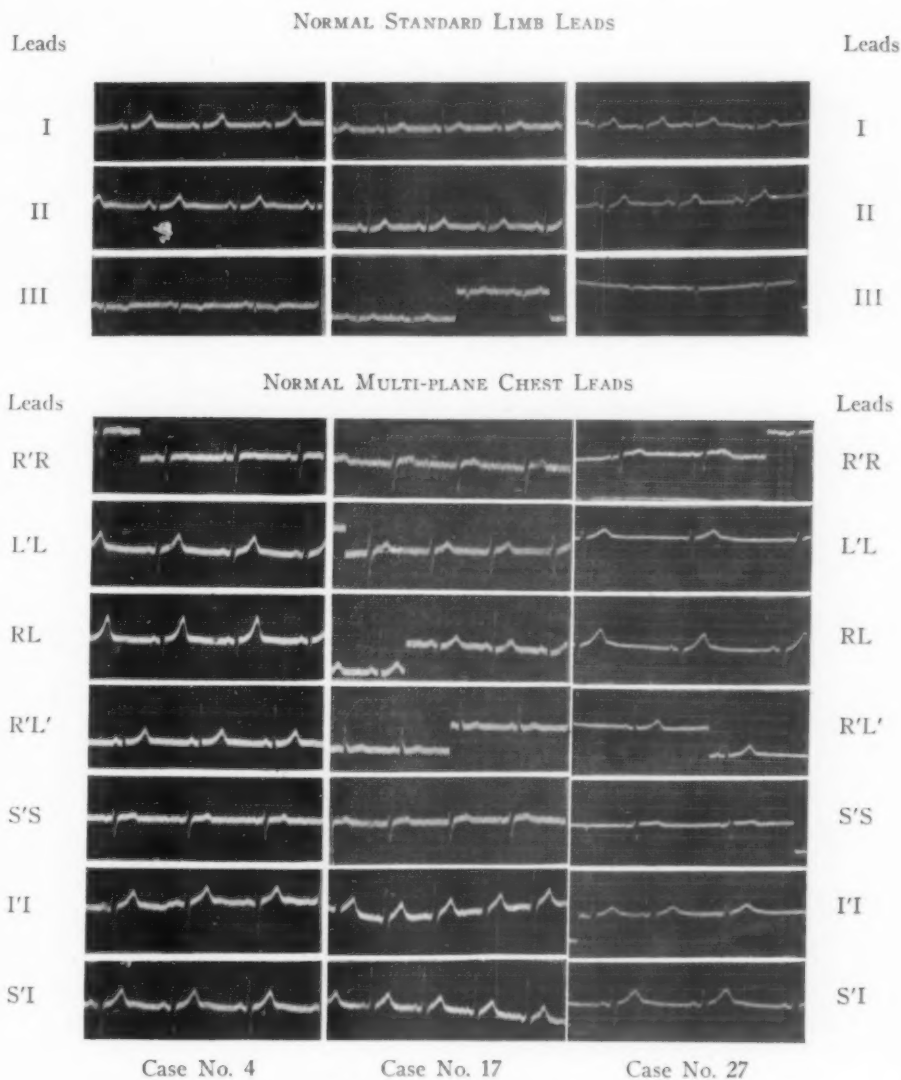


FIG. 4. Normal Cases.

and S'I with very high T-waves. The patient died four weeks after he was examined in an attack of acute coronary thrombosis of 12 hours' duration. Consent for a post-mortem examination was not obtained.

The following two patients showed definite changes in both the standard and the multi-plane chest leads.

Case 11 (figure 6), a male, 55 years of age, gave a history of a chronic, non-specific pulmonary infection of many years' duration. In the past five years he had had repeated attacks of cardiac decompensation. His clinical picture revealed evidence of predominantly right heart failure as evidenced by extensive venous stasis,

a large tender liver, sacral and ankle edema. A roentgen-ray examination of the chest revealed a bilateral hilum and basal infiltration, a widened aorta and enlargement of the heart to both the right and left.

Case 31 (figure 6), a female, 36 years of age, gave a history of an essential hypertension, complaining primarily of headaches and dizziness for many years. For

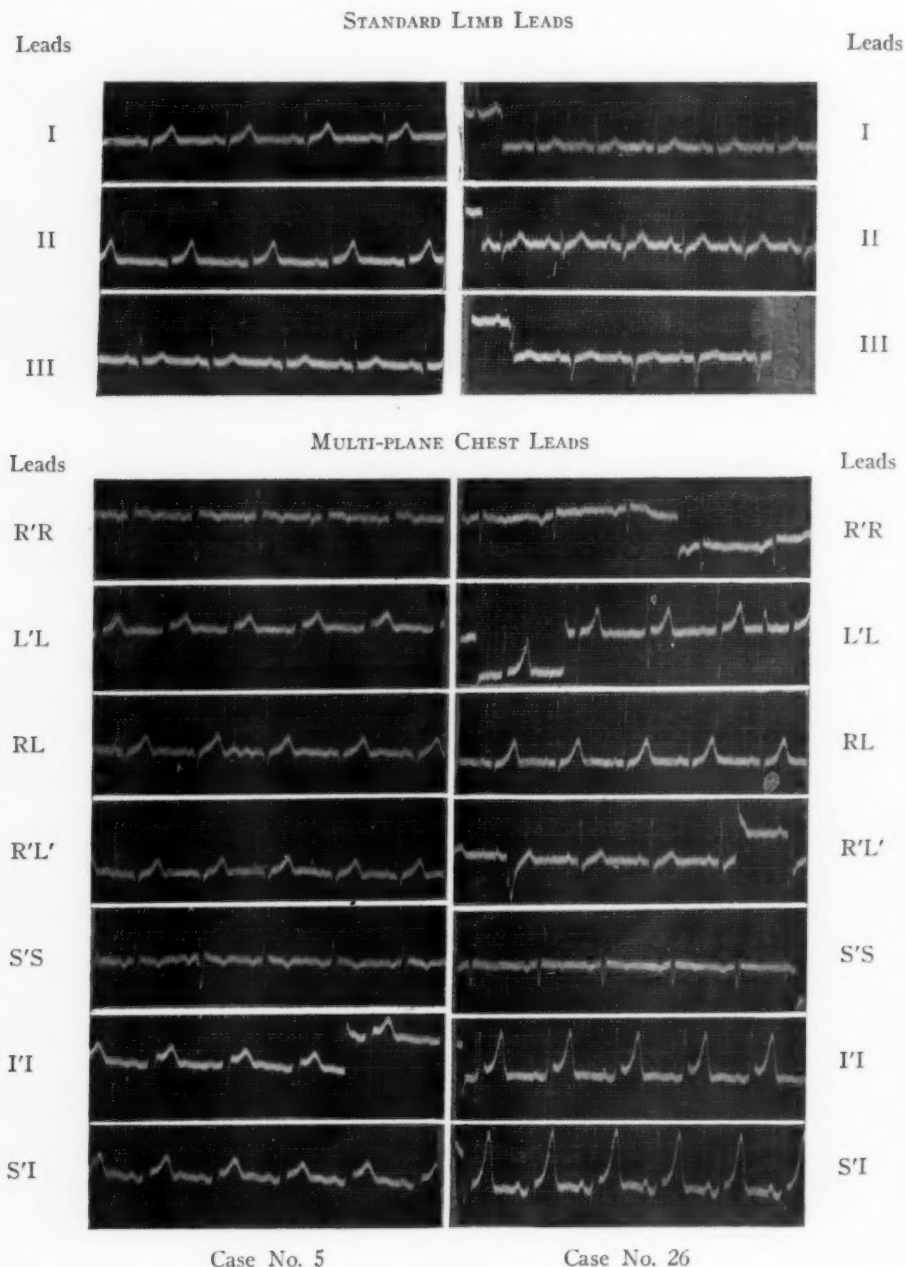


FIG. 5.

the past year she had suffered with palpitation, dyspnea and precordial pain on exertion requiring rest for relief. Clinically there was no evidence of cyanosis, liver enlargement, edema or other evidence of right heart failure. Roentgen-ray examination revealed a widened aorta and an enlargement of the heart to the left. The patient

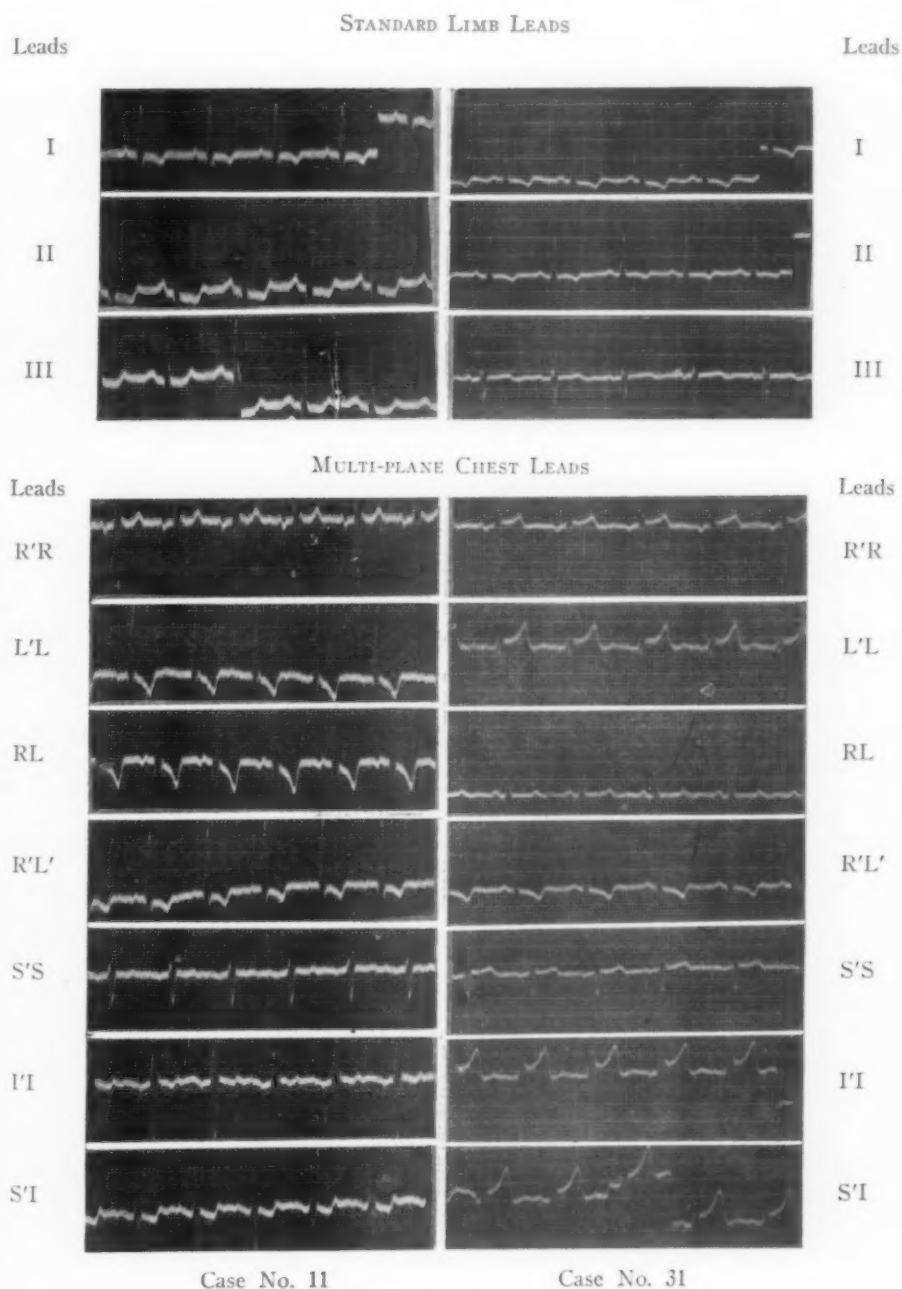


FIG. 6.

died in an acute coronary attack six weeks after she was examined. Postmortem examination of the heart revealed a sclerosis and narrowing of the left coronary artery and an occlusion by a fresh thrombus of its anterior descending branch. There was a myomalacia of the anterior wall of the left ventricle extending to the apex. The right coronary tree was found patent throughout.

The standard limb lead tracings show evidence of severe myocardial damage in both cases but without any definite differential localizing features. The following is a comparative study of the changes in the multi-plane chest lead tracings of the two cases.

<i>Leads</i>	<i>Case 11</i>	<i>Case 31</i>
R'R	Inverted P, prominent S, saddling of RT transition, upright T-wave.	Inverted P, prominent S, elevation of RT transition 1 mm. above iso-electric line, upright T-wave.
L'L	Iso-electric P, prominent R, sharply inverted deep T-wave.	Low upright P, biphasic slurred QRS, elevation of RT transition 1.5 mm. above iso-electric line, upright T, prominent U-wave.
RL	Biphasic P, prominent Q, prominent R, slightly depressed RT transition, markedly inverted deep T-wave.	Upright P, prominent R, low upright T-wave.
R'L'	Upright P, prominent R, slightly depressed RT transition, inverted coved T-wave.	Upright P, prominent R, inverted T-wave.
S'S	Inverted P, prominent slurred S, low upright T-wave.	Biphasic P, prominent slurred S, elevation of RT transition 1 mm. above iso-electric line, upright T-wave.
I'I	Inverted P, biphasic QRS of high amplitude, elevation of RT transition 1 mm. above iso-electric line, biphasic T-wave.	Low upright P, prominent S, saddling and elevation of RT transition 3 mm. above iso-electric line, upright high T, prominent U-wave.
S'I	Biphasic P, biphasic QRS of high amplitude, biphasic T-wave.	Upright P, prominent S, elevation of RT transition 2.5 mm. above iso-electric line, upright high T, prominent U-wave.

COMMENT

In the first two abnormal cases presented, although the standard limb lead tracings appeared to be within normal limits, examination of the multi-plane chest lead tracings revealed definite changes from the normal controls (table 1). These consisted of inversion of the P- and T-waves in Leads R'R and S'S, a marked elevation of the RT transition in Leads I'I and S'I and a slight elevation of the RT transition in Lead L'L. In case 5, the influenzal bronchopneumonia and its sequelae are cited as possible etiologic factors in explaining the myocardial changes observed, while case 26 presented clinically the typical syndrome of advanced coronary artery disease.

Of the next two abnormal cases presented, even though the standard limb lead tracings showed definite myocardial damage in both, they presented no definite differential localizing features; while with the multi-plane chest leads, case 11, which clinically gave a picture of predominantly right heart

TABLE I

Leads	Clinical Considerations	Standard Limb Leads	Multi-plane Chest Leads						
			R/R	L/L	RL	R/L'	S/S	I/I	S/I
Case 4 Case 17 Case 27	Normal cases	Normal tracings	Low upright or biphasic P Prominent S Low upright T	Low or iso-electric P Biphasic QRS Upright symmetrical T	Low upright P Prominent R Low S Upright symmetrical T	Low upright P Prominent S Low upright T	Low upright or biphasic P Prominent S Low upright T	Upright P Biphasic QRS of high amplitude Very high symmetrical T	Prominent upright P Biphasic QRS of high amplitude Very high symmetrical T Prominent U often observed
Case 5	No cardio-vascular symptoms. Negative physical examination. (Attack of influenza bronchopneumonia followed by toxic exhaustive state a few months previously.)	Normal tracings except for a slight (3 mm.) elevation of RT transition of Lead II.	Inverted P Low R Prominent S Inverted T	1½ mm. elevation of RT transition	Normal tracing	Normal tracing	Inverted P Inverted T	Saddling and 2½ mm. elevation of RT transition	Saddling and 2½ mm. elevation of RT transition
Case 26	Hypertensive heart disease Coronary artery disease	Normal tracings except for a left ventricular preponderance and slight slurring of complexes	Inverted P Inverted T	1 mm. elevation of RT transition	Normal tracing	Normal tracing	Inverted P Inverted T	Saddling and 3 mm. elevation of RT transition Very high T	Saddling and 3 mm. elevation of RT transition Very high T
Case 11	Chronic pulmonary infection. Right heart failure (venous stasis, large tender liver, sacral and ankle edema).	Inverted coved T ₁ Depressed RT transition and diphasic T ₂ Depressed RT transition and upright T ₃	Biphasic P Prominent S Saddling of RT and upright T	Iso-electric P Prominent R Sharply inverted deep T	Biphasic P Prominent Q Prominent R Slightly depressed RT transition Sharply inverted deep T	Upright P Prominent R Slightly depressed RT transition Inverted coved T	Inverted P Prominent slurred S Low upright T	Inverted P Biphasic QRS Elevation of RT 1 mm. Biphasic T	Biphasic P Biphasic QRS Biphasic T
Case 31	Hypertensive heart disease Coronary artery disease	Inverted coved T ₁ and T ₂ Diphasic P ₃ and T ₃	Inverted P Prominent S 1 mm. elevation of RT transition Upright T	Low upright P Prominent S 1½ mm. elevation of RT transition Upright high T Prominent U	Upright P Prominent R Low upright T	Upright P Prominent R Inverted T	Biphasic P Prominent slurred S, 1 mm. elevation of RT transition	Low upright P Prominent S Saddling and 3 mm. elevation of RT transition Upright high T Prominent U	Upright P Prominent S 2½ mm. elevation of RT transition Upright high T Prominent U

involvement, presents an entirely different series of tracings from case 31, whose clinical picture indicated predominantly left heart involvement. The abnormalities here noted have been repeatedly observed and appear to be common in these clinical types of cases.

The interpretation of abnormal tracings obtained by the multi-plane chest lead method and their correlation with the clinical phenomena will be discussed in a later communication. The application of this method in experimentally produced lesions in cats is, at present, being investigated.

SUMMARY

A standardized method of chest lead application which surrounds and intersects the heart by planes of current take-off is proposed.

The uniformity of the tracings obtained in a control group of 50 normal cases is observed.

The advantage of the multi-plane chest leads in conjunction with the three standard limb leads in more accurately detecting and localizing myocardial lesions is suggested.

I wish to express my appreciation to Dr. Meyer A. Rabinowitz, Attending Physician to the Jewish Hospital of Brooklyn, for his cooperation, and to the "B" cardiology service of the hospital for the use of their facilities.

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MALARIA THERAPY IN ASYMPTOMATIC NEUROSYPHILIS *

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THIS is a report of the results of treatment with malaria of a group of patients who had asymptomatic neurosyphilis. Under the classification of asymptomatic neurosyphilis are included those cases in which tests of spinal fluid are positive, but in which there are neither signs nor symptoms of syphilitic involvement of the central nervous system. The length of time the patient has had syphilis is not a factor in the incidence of asymptomatic neurosyphilis, for its presence may be demonstrated any time after the infection has been acquired. It has been known for some time that the nervous system becomes invaded at the time of dissemination of the *Spirocheta pallida*; in fact, evidence of invasion of the central nervous system can be demonstrated in certain cases before the "secondaries" have become manifest on the skin or mucous membranes. It has been shown that the spinal fluid is abnormal in 32.7 per cent of cases of acute syphilis, including those in which the patient has a chancre but is serologically negative, as well as those in which late secondary manifestations are present. Moreover, reports¹ indicate that the spinal fluid of from 18 to 35 per cent of patients with latent syphilis is positive to test. Asymptomatic neurosyphilis can be recognized only by examination of spinal fluid obtained either by lumbar or by cisternal puncture. Accordingly, in view of the relatively high incidence of this type of neurosyphilis, it is imperative that examination of spinal fluid be made in all cases of acute syphilis some time during the first year of treatment, and in all cases of latent syphilis in which the patients are about 60 years of age or less.

Moore has called attention to the fact that the incidence of serologic cure in cases of asymptomatic neurosyphilis is dependent on the type of neurologic invasion as indicated by the nature of the findings on examination of spinal fluid. For example, if the spinal fluid gives evidence of only a mild degree of involvement, as evidenced by a negative or weakly positive Wassermann reaction, a positive Nonne reaction, slight pleocytosis (between 20 and 50 cells per cubic millimeter), and a negative or syphilitic type of colloidal curve (benzoin or mastic), the serologic response to treatment is usually very rapid and satisfactory in the majority of cases. An example of the severe type of involvement is the case of asymptomatic neurosyphilis in which the spinal fluid gives a strongly positive Wassermann reaction, a strongly positive Nonne reaction, a zone I or paretic type of colloidal test, and the cell count is 50 or more per cubic millimeter of fluid. In such cases the response to treatment is satisfactory in from 30 to 50 per cent of the

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cases only. Between these two extremes of cases in which results are good and cases in which results are poor are many cases, in the majority of which the serologic response to treatment will be satisfactory, but in some of which serologic positivity will be retained in spite of the intensive application of arsphenamine, bismuth, and mercury.

Sufficient evidence has now been accumulated to allow the assertion that the patient with asymptomatic neurosyphilis whose spinal fluid does not become negative, and thereafter retain its negativity, either from intensive treatment or his own resistance, is a potential candidate for parenchymatous or vascular neurosyphilis. In such a case tabes dorsalis or paralytic dementia eventually is prone to develop. There is another group of patients known as "chronic relapsers" whose spinal fluid completely reverts to negative following treatment, but who subsequently have neurorelapses with recurrence of positivity of spinal fluid when treatment is stopped. The appearance of clinical signs and symptoms of neurologic involvement is also the rule with these patients.

Accordingly, the program of treatment of asymptomatic neurosyphilis should be materially influenced by the type of invasion of the central nervous system as revealed by reports of tests on the spinal fluid. In those cases in which invasion of the nervous system is of mild degree, routine use of arsphenamine, with either mercury or bismuth, usually produces complete and permanent serologic negativity after four courses of treatment (24 injections of arsphenamine and 60 injections of bismuth as a minimum). If invasion of the central nervous system is of moderate degree, as evidenced by the spinal fluid findings, such a routine course of treatment may not produce serologic reversal, and it then may be necessary to augment the treatment. It has been my practice in this type of case, if the first course of arsphenamine does not bring about material signs of improvement as evidenced by serologic tests of spinal fluid, to intensify the treatment by addition of intraspinal injections, daily intramuscular injections of the succinimide of mercury or of a preparation of bismuth, and liberal use of sodium or potassium iodide. Contrary to the general impression, I have found intraspinal therapy to be of decided value in this type of case. Three or four combined courses may be necessary to maintain negativity of spinal fluid.

In the case of asymptomatic neurosyphilis in which the original spinal fluid factors are strongly positive, and the colloidal test is of the paretic type, the use of the therapeutic measures which I have mentioned may not reverse the serologic tests to negative, or the reversal to negative may be only temporary, and as soon as treatment is discontinued the spinal fluid may again become positive. I have observed cases of asymptomatic neurosyphilis in which a favorable serologic response failed to appear even though more than 100 injections of arsphenamine, with corresponding amounts of mercury, had been given. The explanation of these therapeutic failures may be: (1) therapeutic inefficiency of the remedies, (2) resistance of the in-

fecting organism (resistant neurotropic strain of the *Spirocheta pallida*), or (3) inadequacy of the soil (lack of resistance).

In regard to inefficiency of drugs, it may be said that a sufficiently large number of patients with asymptomatic neurosyphilis have been treated successfully by arsphenamine and heavy metals to emphasize the value of these specific remedies in controlling the majority of the cases. Accumulated statistics show that approximately 85 per cent of patients with asymptomatic neurosyphilis derive satisfactory response from treatment. The failures must be attributed to some other factor than the inefficiency of the drugs. In the laboratory animal a neurotropic strain of *Spirocheta pallida* can be demonstrated to have special affinity for its nervous system. However, in the human being such a demonstration is lacking; in fact, clinical appraisals have failed to substantiate the existence in man of such a strain.⁵ Advocates of the concept that there is a strain neurotropic to man have not as yet proved their contention. The soil on which the *Spirocheta pallida* lights is of more significance in determining the subsequent course of the disease than is the strain of the *Spirocheta pallida*. Therefore, the explanation for many of the failures in treatment of asymptomatic neurosyphilis is attributable to the patient and not to the infecting organism. In other words, the factor of resistance seems to be the most important of the three concepts which are offered in an effort to explain failures of treatment in these cases.

Accordingly, malaria was sought as an agent to stimulate the defensive mechanism of a group of patients in treatment of whom the intensive use of arsphenamine, mercury, and bismuth had failed to produce negative tests of spinal fluid. In 1926 I inoculated with *Plasmodium vivax* a patient with asymptomatic neurosyphilis who had received an enormous amount of anti-syphilitic treatment but whose spinal fluid had remained positive. I selected malaria therapy because two years' experience with it at that time had impressed on me the value of the method in the treatment of dementia paralytica, and it was hoped that it would be of equal value in the prevention of this condition.^{3, 4}

In the past 10 years I have inoculated with malaria 89 patients who had asymptomatic neurosyphilis. Sixty-three of these have reported back recently enough to warrant serologic appraisal. Most of these patients had previously been given the advantage of treatment with arsphenamine, mercury, and bismuth, in varying degrees of intensity, but had failed to obtain satisfactory serologic changes. Clinical signs and symptoms of neurosyphilis were not present in any of the cases. A course involving 12 episodes of chill and fever was given, following which progress of the malaria was stopped by administering quinine sulphate. The patients were then observed for six months or a year without treatment of any type, at the end of which time the spinal fluid was reexamined. If the spinal fluid at that time gave evidence of definite improvement, observation was continued for six months or a year longer. On the other hand, if the report did not give evidence of improvement, the patient was again given arsphenamine,

mercury or bismuth, and intraspinal injections, or, if these were not employed, tryparsamide, and bismuth were administered.

A compilation of serologic changes discloses that in 58 per cent of the cases in which the central nervous system was invaded to a mild degree, and in 30 per cent of those in which it was invaded to a severe degree, the reaction of the spinal fluid was completely reversed to negative as a result of the malaria therapy alone (table 1). In a group of 41 cases in which

TABLE I
Malaria Therapy only (22 Cases). Results as Reflected in Reaction of Spinal Fluid

Results of Original Examination of Spinal Fluid	Cases	Completely Reversed to Negative, Per Cent	Partially Reversed to Negative, Per Cent	Not Improved, Per Cent
Mildly to moderately positive	12	58 (7 cases)	16 (2 cases)	26 (3 cases)
Strongly positive; paretic	10	30 (3 cases)	50 (5 cases)	20 (2 cases)
Totals	22	44	33	23

the customary antisyphilitic treatment was given after malaria therapy, satisfactory serologic reversals were noted in 40 per cent of the cases in which the spinal fluids were mildly involved, and in 31 per cent of the cases in which the spinal fluids were severely involved (table 2). It is obvious

TABLE II
Malaria Therapy Followed by Special Antisyphilitic Treatment (41 Cases). Results as Reflected in Reaction of Spinal Fluid

Results of Original Examination of Spinal Fluid	Cases	Completely Reversed to Negative, Per Cent	Partially Reversed to Negative, Per Cent	Not Improved, Per Cent
Mildly to moderately positive	22	40 (9 cases)	23 (5 cases)	32 (7 cases)
Strongly positive; paretic	19	31 (6 cases)	42 (8 cases)	26 (5 cases)
Totals	41	35.5	32.5	29

that an appraisal of malaria therapy can be based only on the cases in which no other treatment was given. It has been my practice to estimate the serologic results at intervals of six or twelve months after the course of malaria, and if the serologic reports did not give evidence of improvement, the patient was again given the customary antisyphilitic treatment. Accordingly, the patients noted in table 1 included those who received early benefit, and also several who did not return for reexamination until several years had elapsed following malaria treatment, but when they did return

their spinal fluids were reported as negative. The malaria treatment was given in an effort to augment the specific remedies and not to supplant them

TABLE III

The Entire 63 Cases* Which Could Be Followed. Results are Reflected in Reaction of Spinal Fluid

Results of Examination of Spinal Fluid	Cases	Completely Reversed to Negative, Per Cent	Partially Reversed to Negative, Per Cent	Not Improved, Per Cent
Mildly to moderately positive	40	50	28	22
Strongly positive; paretic	23	39	39	22
Total	63	44.5	33.5	22

* Status unknown, 19; died since course of malaria from causes other than syphilis or malaria, 5; died as result of malaria, 1; relapsed, 1.

entirely; hence, the inclusion of all of the cases in table 3 is warranted. In other words, when it was found that malaria alone was not producing serologic reversals, the accepted antisyphilitic agents were used intensively in a further effort to ward off development of parenchymatous neurosyphilis. Table 3 shows that in 44.5 per cent of the group as a whole, the spinal fluid became negative serologically. Another decade must elapse before appraisal of this group of cases for signs and symptoms of neurosyphilis will be of significance. However, it is worthy of comment that up to the present none of the patients included in this study has given clinical evidence of late neurosyphilis. For the present, estimation of the results can be based only on

TABLE IV
Summary of Case 1

Date	Blood, Wassermann	Wassermann	Nonne	Spinal Fluid		Colloidal Benzoin	Treatment
				Cells per Cubic Milli-meter			
3-28-29	4444	444 -	+	179* 24† 45‡	333 313 333 320 000		Arsphenamine (1.8 gm.) (6)
							Mercuric succinimide (0.33 gm.) (33)
							Sodium iodide intravenously (19.5 gm.) (30)
							Intraspinal injections (3)
11- 7-29	4444	443 -	+	37	333 303 233 210 000		Inoculation Malaria
9-28-32	22- -	-	-	3	000 000 333 310 000		No treatment
2- 7-34	1-- -	-	-	1	000 002 333 100 000		No treatment

* Small lymphocytes.

† Large lymphocytes.

‡ Polymorphonuclears.

the serologic changes in patients observed for a period varying from three to ten years following malaria therapy.

A few illustrative cases are cited to emphasize the character of the serologic changes.

CASE REPORTS

Case 1. (Table 4.) The patient was a woman, aged 37 years. A history of syphilis could not be elicited. The diagnosis of asymptomatic neurosyphilis was made in 1929 as a result of a routine Wassermann test of the blood and an examination of spinal fluid.

Case 2. (Table 5.) A man, aged 21 years, had a chancre and a macular eruption in April 1928. Treatment was started immediately, but following the second course he stopped taking treatment, to return in a year with a cutaneous recurrence. He permitted another year to elapse following the fourth course and returned with a neurorecurrence.

TABLE V
Summary of Case 2

Date	Blood, Wasser- mann	Wasser- mann	Nonne	Spinal Fluid		Colloidal Benzoin	Treatment
				Cells per Cubic Milli- meter			
5-16-28	44						Bismarsen (1.6 gm.) (8)
7-17-28	44						Bismarsen (1.6 gm.) (8)
5-22-29	44	—	—	5	Cutaneous recurrence 000 000 333 100 000		Bismarsen (1.6 gm.) (8)
8-13-29	44						Bismarsen (1.6 gm.) (8)
6-23-30	43	42 - - -	+	7	Neurorecurrence 000 000 332 000 000		Arsphenamine (6) Mercuric succinimide (24) Inoculation Malaria
10- 9-30	43	4441-	+	14* 23†	000 002 333 000 000		
2-24-33	1-	—	—	1	000 003 333 110 000		No treatment
4- 6-34	1-	—	—	2	000 001 333 300 000		No treatment

* Small lymphocytes.

† Large lymphocytes.

Case 3. (Table 6.) A laborer, 34 years of age, acquired syphilis in 1915, for which he was given 15 mercury rubs. A diagnosis of asymptomatic neurosyphilis was made in May 1922.

Case 4. (Table 7.) A Greek, aged 32 years, acquired syphilis in 1915. Treatment was started immediately, and by 1922 he had received 46 injections of arsphenamine with unknown amounts of mercury (by injection and by mouth). A positive spinal fluid was recognized at this time, so he went to Vienna where he was given intravenous injections of typhoid vaccine and injections of tuberculin. He came under my care in 1925.

Case 5. (Table 8.) A young woman was found to have a positive Wassermann

test of the blood in 1924 and a positive spinal fluid test in 1925. When she came under my care in 1926, she had received 48 injections of arsphenamine and 48 injections of mercuric salicylate.

TABLE VI
Summary of Case 3

Date	Blood, Wasser- mann	Wasser- mann	Spinal Fluid		Colloidal Benzoin	Treatment
			Nonne	Cells per Cubic Milli- meter		
5- 7-22	++++	++++	+	41		Arsphenamine (3.8 gm.) (6)
11- 9-22	++++	++++	+	89	333 333 333 333 000	Mercuric succinimide (27) Arsphenamine (2.5 gm.) (6)
9- 1-23	44- - -	44- -	+	41	023 320 333 322 000	Mercuric succinimide (21) Arsphenamine (3.1 gm.) (10)
1- 8-24	-	44- - -	+	2	000 000 333 200 000	Mercuric salicylate (16.0 gm.) (8) Arsphenamine (3.3 gm.) (10)
6-28-24	-	44- - -	+	1	000 000 232 000 000	Mercuric salicylate (10.0 gm.) (10) Intraspinal in- jections (4) Tryparsamide (18.0 gm.) (6)
2- 8-25	-					Bichloridol (15.0 gm.) (10) Tryparsamide (28.0 gm.) (10)
10-11-25	-					Bismuth (2.0 gm.) (13) Tryparsamide (28.0 gm.) (10)
2-22-26	-					Bismuth (2.0 gm.) (14) Tryparsamide (29.0 gm.) (10)
7- 6-26	-	2- - - -	+	4	002 000 333 200 000	Bismuth (4.0 gm.) (20) Tryparsamide (28.0 gm.) (10)
3- 4-27	-	441- -	+	18	133 313 331 000 000	Bismuth (4.0 gm.) (20) Inoculation Malaria
8- 1-27	-	-	-	1	011 003 331 000 000	No treatment
2- 1-28	-	-	-	3	000 001 320 000 000	No treatment
2- 2-29	-	-	-	1	000 002 333 100 000	No treatment
9- 1-30	-	-	-	1	000 000 333 100 000	No treatment
8-13-33	-	-	-	1	000 001 333 100 000	No treatment

TABLE VII
Summary of Case 4 after Patient Came under Author's Care

Date	Blood, Wasser- mann	Spinal Fluid			Colloidal Benzoin	Treatment
		Wasser- mann	Nonne	Cells per Cubic Milli- meter		
9-15-25	-	4441-	+	33	011 100 333 100 000	Arsphenamine (2.3 gm.) (6) Mercuric succinimide (0.23 gm.) (20) Sodium iodide (13 gm.) (20) Intraspinal in- jections (3) Mercurial in- jections (40)
3- 5-26	-	444- -	+	27	023 300 333 200 000	Arsphenamine (2.7 gm.) (7) Mercuric succinimide (0.24 gm.) (24) Sodium iodide (13 gm.) (20) Intraspinal in- jections (4) Bismuth (at home) (10)
9- 1-26	-	441- -	+	5	233 300 333 200 000	Arsphenamine (2.3 gm.) (6) Bismuth (1.8 gm.) (18) Bismuth (at home) (15)
2- 9-27	-	421- -	+	14	023 300 333 000 000	Inoculation Malaria
2-11-28	-	-	+	4	011 003 330 000 000	No treatment
8- 6-29	-	-	-	1	000 000 033 200 000	No treatment
7-21-30	-	-	-	1	000 000 333 100 000	No treatment
1- 3-34	-	-	-	1		No treatment

SUMMARY

In the past 10 years 89 patients who had asymptomatic neurosyphilis were treated with malaria when the serologic tests on the spinal fluid had failed to become reversed to negative following intensive use of arsphenamine, mercury, and bismuth. In 50 per cent of the cases in which invasion of the nervous system was of mild degree, the serologic reactions became completely negative following malaria therapy, irrespective of whether antisyphilitic treatment was given after induction of malaria. In 39 per cent of cases in which the formula of the spinal fluid was of the paretic type, the spinal fluid factors were reversed to negative following malaria therapy. Among those cases in which the usual antisyphilitic treatment was not given following malaria treatment, there was satisfactory reversal to negative of the spinal fluids in 58 per cent of those in which reports on the spinal fluid

TABLE VIII
Summary of Case 5 after Patient Came under Author's Care

Date	Blood, Wasser- mann	Wasser- mann	Nonne	Spinal Fluid		Colloidal Benzoin	Treatment
				Cells per Cubic Milli- meter			
8-11-26	33	4411-	+	45	000 000 332 300 000	Arsphenamine (2.3 gm.) (6)	
						Mercuric succinimide (0.2 gm.) (18)	
						Sodium iodide (11 gm.) (17)	
						Intraspinal in- jections (3)	
						Mercurial in- unctions (40)	
2- 4-27	-	-	+	13	000 000 331 000 000	Arsphenamine (2.2 gm.) (6)	
						Mercuric succinimide (0.23 gm.) (21)	
9- 1-27	-	-	+	5	001 000 021 100 000	Arsphenamine (1.9 gm.) (5)	
						Mercuric succinimide (0.15 gm.) (16)	
						Sodium iodide (3.0 gm.) (9)	
						Bismuth (at home) (35)	
2- 3-28	44	4421-	+	22* 3†	033 103 333 100 000	Inoculation Malaria	
9-18-28	21	21- - -	-	2	002 003 331 000 000	Arsphenamine (1.9 gm.) (6)	
						Mercuric succinimide (0.22 gm.) (20)	
						Bismuth (at home) (15)	
4- 4-29	-	-	-	3	121 003 311 000 000	Arsphenamine (1.8 gm.) (6)	
						Bismuth (1.2 gm.) (12)	
10-18-33	-	-	-	1	000 000 331 000 000	No treatment	

* Small lymphocytes.

† Large lymphocytes.

had indicated only mild or moderate involvement, whereas among cases in which the formula of the spinal fluid was of paretic type, in only 30 per cent was there a reversal to negative. When it was observed that the results from malaria therapy alone were unsatisfactory at the end of the first year, arsphenamine and mercury or bismuth again were given intensively. In other words, if favorable results from malaria treatment were lacking at the end of six or twelve months, intensive specific antisyphilitic measures were instituted in an effort to ward off the appearance of parenchymatous changes in the nervous system.

The absence of serologic relapse was one of the outstanding features of this study. In only one case did I find a relapse to positivity of the spinal fluid after a negative report had been obtained following malaria treatment. Death occurred in one case, the cause for which could not be found at necropsy.

Fever treatment by the newer electrical devices has also been tried in a few cases, but sufficient time has not as yet elapsed to allow deductions to be made in regard to this method of treatment.

Ample evidence is now at hand to allow the assertion that asymptomatic neurosyphilis is the forerunner of dementia paralytica or tabes dorsalis. Also, it is an acknowledged fact that in many cases of asymptomatic neurosyphilis a satisfactory serologic response follows intensive application of the so-called specific remedies. However, this study further emphasizes the fact that those patients who fail to derive serologic reversal from specific agents are entitled to the benefit of malaria therapy because, on a basis of comparative percentages, malaria therapy is more valuable in the prevention of parenchymatous neurosyphilis than it is in the treatment of it.

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CONGENITAL CYSTIC DISEASE OF THE LUNGS *

CASE REPORTS

By LEWIS J. MOORMAN, M.D., F.A.C.P., *Oklahoma City, Oklahoma*

THE first report on congenital cystic disease of the lungs in the American literature was made by Koontz¹ in 1925. In Europe Pappenheimer³ had reported his study of a museum specimen as early as 1912. Following Koontz's article further cases have been reported in this country by Wood and Garvin,² Robert Miller, Jr.,⁴ Eloesser,^{5, 6, 7} Moore,⁸ Lehnhoff,⁹ Swanson, Platou and Sadler,¹⁰ Lilienthal,¹¹ Gibson,¹² Tillotson,¹³ Parmelee and Apfelbach,¹⁴ Stewart, Kennedy and James,¹⁵ Nelson,¹⁶ Cabot,¹⁷ Pollock and Marvin,¹⁸ Wolman,¹⁹ Anspach and Wolman,²⁰ Crosswell and King.²¹ The reported American cases now number 30.

These 30 cases fall roughly into two age groups. Eleven cases were found in infants, the clinical features which attracted attention being attacks of dyspnea and cyanosis with ultimate respiratory failure. The remaining cases (with the exception of one stillborn case¹⁰ and two or three cases occurring in later childhood or adolescence) were all discovered in patients between the ages of 20 and 60 years. In this adult group the predominant clinical symptoms were persistent or recurring attacks of cough, expectoration, dyspnea and cyanosis. In addition the occurrence of pain in the chest, hemoptysis, and of febrile attacks is reported in several cases.

A study of the data of these 30 cases suggests that 16 were instances of polycystic disease while 14 were apparently cases of solitary cyst.

In 1925 Koontz¹ published with his case report a careful review and analysis of 108 European cases. These cases ranged in age from one day to 84 years, five cases being reported as stillborn. Forty-five were males, 38 females, and the sex of 25 was not mentioned. The disease was unilateral in 72 instances and bilateral in 27; in nine the site of the disease process was not reported. Of the 72 unilateral cases, 47 were in the left lung and 25 in the right.

While the clinical data were very incomplete, the following were among the predominant symptoms: cough, expectoration, dyspnea, cyanosis, and periodic febrile attacks with exacerbation of the above symptoms. Symptoms, however, were not uniformly present, since many of the reported cases were first discovered at autopsy or by roentgen-ray examinations. The most common cause of death was pneumonia. A number of cases had died in infancy or early childhood because of intrathoracic pressure with marked dyspnea and cyanosis. This condition is brought about by respiratory inflation of the cysts through valve-like communications, which cause retention of the inspired air.

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In Koontz's paper the available pathological data on each of the 108 European cases have been assembled. A careful study of these brief yet fairly complete notes indicates that 51 of the cases are classified as congenital polycystic disease, and 31 were reported as congenital bronchiectasis, or atelectatic bronchiectasis. Solitary cyst was reported in 16 cases. In the 10 remaining cases various congenital cystic and non-cystic conditions are reported which apparently should not be classified as congenital cystic disease of the lungs.

DIAGNOSIS

It is evident from the literature reviewed above that the clinical picture in congenital cystic disease of the lungs may be a very complex one, offering grave diagnostic difficulties.

Among the factors which may influence the clinical picture are: the question of whether the cysts do or do not communicate with a bronchus, since closed cysts may contain fluid; the question, in cysts that do communicate with a bronchus, whether there is a valve-like action in the narrow bronchus which results in inflation of the cyst with consequent pressure effects; the extent of pressure-atelectasis of the non-cystic lung tissue due to encroachment of the cysts, and the presence or absence of secondary infection leading to pleural adhesions, areas of pneumonitis, bronchiectasis, etc.

If the cysts do not communicate with the bronchi, or if there is free communication without secondary infection there may be no symptomatic evidence of the disease. If the cysts and the bronchi communicate, with valve-like constrictions at the point of communication, distressing and even fatal dyspnea and cyanosis may develop. In other cases escaping early fatal intrathoracic pressure, the symptoms may range from those representing a mild bronchitis to those found in cases of advanced pulmonary tuberculosis, or in non-tuberculous suppurative pulmonary infections. With such a marked variation in clinical and pathological manifestations, one may expect the physical signs to cover a correspondingly wide range. Roentgen-ray studies present similar diagnostic difficulties.

The differential diagnosis must begin with intracranial and intrathoracic birth injuries and end with the respiratory affections of old age. In infancy, thymic syndrome and congenital pulmonary atelectasis are to be considered. In later life congenital cystic disease must be differentiated from pulmonary tuberculosis; non-tuberculous pulmonary infections including pulmonary abscess and bronchiectasis; massive pulmonary atelectasis; congestive heart failure; other types of intrathoracic cysts; spontaneous pneumothorax; intrathoracic new growths; diaphragmatic hernia; and possibly from foreign bodies in the bronchi.

The above conditions enter the field of differential diagnosis, chiefly because of the varied clinical and pathological manifestations possible in the course of congenital cystic disease of the lungs. While space will not

permit a separate consideration of each condition with which this disease may be confused, it may be useful to call attention to certain of the chief diagnostic features of this condition which are to some extent distinctive.

First, the history of the case may yield valuable diagnostic data. The existence of cough, dyspnea and cyanosis from the time of birth or for at least a period of years, plus a history of periodic exacerbations of the respiratory symptoms and signs, should lead one to suspect the possible presence of congenital cystic disease. Repeated sputum examinations negative for tubercle bacilli support the above suspicion. Such a history, supplemented by a careful physical examination, will considerably narrow down the number of diagnostic possibilities. A careful study of good stereo roentgen-ray films may yield decisive diagnostic information. In case polycystic disease of the lungs is present, even though there may be areas of opacity as a result of atelectasis and associated infection, the films may reveal a designless net-work with graceful lines falling across large areas, practically devoid of lung markings. These fine lines do not correspond in location, direction, or in general appearance to the uniform tracings of the normal bronchial tree; nor to those occasionally appearing as a result of thickened pleura in the interlobar fissures. Neither do they have the appearance of the well defined shadows occasionally produced by thin-walled tuberculous cavities. The mediastinal structures may be undisturbed or they may be displaced toward the affected side through the influence of atelectasis, fibrosis and pleural adhesions, or in the opposite direction through over-distention of the cysts.

The above described picture may be considered pathognomonic of open polycystic degeneration of the lung. In doubtful cases bronchoscopic exploration and lipiodol injections followed by roentgen-ray studies may be of material aid. If the pleural cavity is not obliterated by adhesions, artificial pneumothorax may supply definite diagnostic data.

In case the cysts do not communicate with the bronchi, they may, or may not, contain fluid. The diagnosis of fluid-containing congenital cysts may require the elimination of dermoid and echinococcic cysts and new growths. Dermoid cysts may often be definitely identified by sufficient roentgen-ray penetration to discover the presence of opaque contents such as teeth, bone and cartilage. The present available specific diagnostic procedures should determine the presence or absence of echinococcic cysts. Diaphragmatic hernia admitting portions of stomach and intestines to the thoracic cavity, may be differentiated by the presence of intrathoracic borborygmi and by roentgen-rays following an opaque meal. In the instances of circumscribed pneumothorax and of new growths, a period of observation will usually disclose changes which will assist in differentiating these conditions from congenital cystic disease.

PATHOGENESIS

The pathogenesis of congenital pulmonary cysts has received much consideration without consensus of opinion. Architectural and histological studies indicate that the majority of such cysts are bronchogenic in character; others are reported as being lymphangiomatous and still others reveal their origin by the presence of a lining of gastric or esophageal mucosa. Anspach and Wolman²⁰ believe that all congenital air cysts are fluid-filled cysts at birth. In their opinion, the transformation is post-natal and may be followed by the kaleidoscopic clinical course pictured above. They assume that the cysts rupture into the bronchi and that the escaping fluid is swallowed as it is replaced by inspired air. A study of the reported stillborn cases tends to support this teaching.

TREATMENT

The distressing attacks of dyspnea and cyanosis, often occurring soon after birth, may be relieved through equalization of intrathoracic pressure by introducing a needle into the inflated cyst, or cysts. Though this is not free from hazards, it may relieve symptoms and prolong life while more radical surgical procedures are being considered. When possible, the introduction of a needle for the relief of intrathoracic pressure should be assigned to someone experienced in the use of artificial pneumothorax. This is important because the patient's interests may be safe-guarded by a practical knowledge of intrathoracic phenomena as expressed through manometric readings.

Symptom-free cases accidentally discovered, should be closely observed and periodically checked through the study of serial roentgen-ray films. The treatment of other cases surviving the period of infancy should be planned according to the exigencies of the individual case. Those resembling advanced pulmonary tuberculosis or extensive pulmonary suppurative infections, and manifesting persistent progressive symptoms and signs, should be carefully studied with a view to surgical management. The surgical measures of choice and the successive surgical steps will depend upon the clinical condition of the patient, and the character, extent, and location of the pathologic lesions.

CASE I

R. W. B., white male, aged 28. First examined on 6/3/32. *Chief complaints:* fever, productive cough, shortness of breath and loss of strength.

Family History: Negative. Married nine years, wife and three children in good health. Past personal history uneventful except as it relates to the present illness.

Present Illness: The patient has had shortness of breath and paroxysmal attacks of coughing for as long as he can remember. About three weeks before coming for examination, he became acutely ill with fever and chilly sensations. These symptoms were accompanied by increased cough and expectoration and by loss of strength.

Supplementary history obtained from patient's mother indicates that he had an attack of fever at eight years of age which was diagnosed as bronchopneumonia and

lasted for about six months. He lost weight and strength, and the attending physician evidently suspected tuberculosis. He has suffered from similar attacks two or three times each year until three years ago. Though he continued to cough and expectorate quantities of sputum, this is the first acute attack in three years.

Physical Examination: A man of small stature, moderately overweight. Skin and mucous membranes pale, suggesting secondary anemia. There was obvious dyspnea and slight cyanosis. Temperature 101, pulse 144; respiration 36; blood pressure 95 mm. of Hg systolic and 70 diastolic.

The further examination was essentially negative aside from the examination of the lungs which revealed a classical picture of advanced pulmonary tuberculosis of the right lung with multiple cavities. Signs of the latter predominated over the upper half of the right thorax. There was marked dullness at the right base; it was thought that the right diaphragm occupied a relatively high position and was apparently immobile. There were a few medium crackling râles in the lower half of the left lung. The heart and trachea were displaced toward the right. All these phenomena were considered rather typical of chronic ulcerative pulmonary tuberculosis with thickened adherent pleura and possibly atelectasis.

The first stereo roentgen-ray films (figure 1 *A*) were reported as follows: "Roentgen examination of the chest reveals a very heavy infiltration on the right side around the hilus and reaching down to the diaphragm. Beyond this heavily infiltrated area the chest presents a very peculiar appearance as if it were filled with bubbles. Laterally and above the hilus region these so-called bubbles are intermixed with some heavy, irregular shadows. The trachea is pulled toward the right side. The point of bifurcation can be very definitely located at a point at least one-half inch to the right of the margin of the spine.

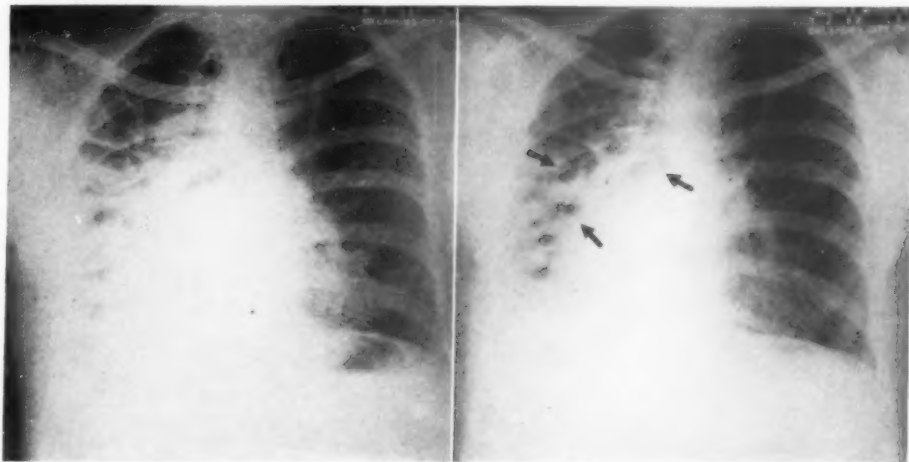


FIG. 1 *A* and *B* (Case 1). In this picture *A* represents a film made on 6/1/32. Note the heavy infiltration in the lower half of right lung with irregular tracings immediately above, also absence of tracing at apex. There is moderate infiltration toward the base of left lung. The heart and trachea are obviously displaced toward the right. *B* represents a film made 7/2/32, two weeks after right phrenicectomy. Note the rather marked reduction in the opacity both right and left. There is no change in the position of mediastinal structures.

"The left hilus shadow is very broad and heavy. Extending outward and downward from this is a heavy, mottled infiltration which reaches out in quite close proximity to the periphery. The upper third of the left chest shows a heavy peribronchial

infiltration, but is fairly clear in comparison with the lower part. Left dome of the diaphragm is regular in outline. *Diagnosis:* Active tuberculosis (far advanced)."

This interpretation is interesting in that it definitely describes the polycystic degeneration, yet reports a diagnosis of "active tuberculosis, far advanced." The tentative clinical diagnosis was advanced pulmonary tuberculosis. Though the unusual roentgen-ray findings were puzzling, the patient was admitted to the Farm Sanatorium as a case of pulmonary tuberculosis.

Repeated negative sputum examinations led to further doubt and the diagnosis was changed to that of nontuberculous pulmonary infection with unusual bronchiectatic, of cystic, cavities. The marked displacement of mediastinal structures toward the affected side was attributed to pulmonary atelectasis and fibrosis resulting from the long continued mixed infection. Careful examination of the sputum for fusospirochetal types of organisms proved negative. Sputum cultures and guinea pig inoculation failed to yield diagnostic data.

While resting in bed the patient's temperature ranged from 97° to 101°, the pulse rate from 80 to 132. He raised six to eight ounces of sputum daily.

After two weeks' observation, collapse therapy was advised. Artificial pneumothorax was impossible because of pleural adhesions; a right phrenicectomy was done June 16. As a result of phrenicectomy, there was a 50 per cent reduction in cough and sputum. Complete thoracoplasty was advised but was refused by the patient ostensibly because of a desire to change climate. The patient remained under observation until July 26, 1932.

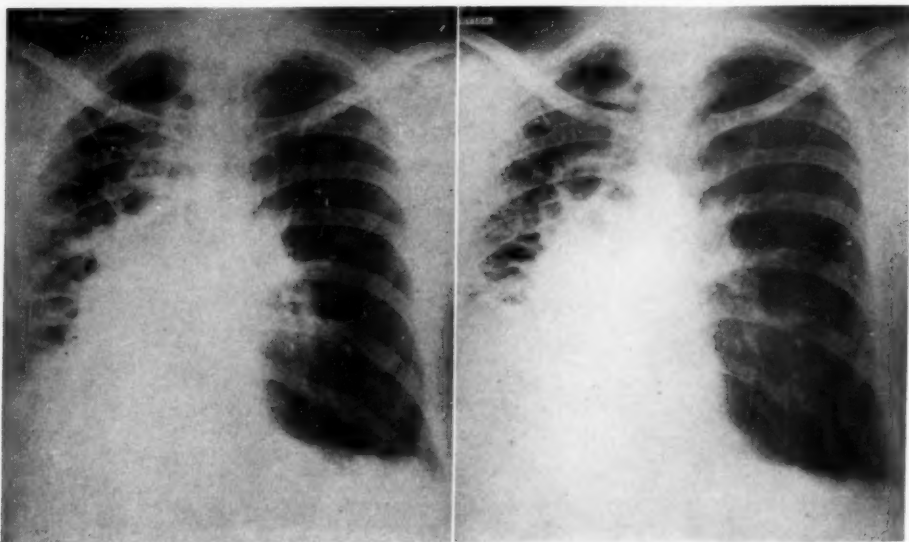


FIG. 2 *A* and *B*. (Case 1.) *A* represents a film made 7/27/32. Note further clearing of opacity in right lung, also in lower left. *B*, made 11/14/33, shows further clearing of opacity and the more obvious irregular tracings throughout the right lung. The right diaphragm is elevated. The position of mediastinal structures is unchanged.

Stereo films made two weeks after phrenicectomy (figure 1 *B*) revealed some decrease in the density of the infiltrated areas with resulting accentuation of the polycystic condition.

Several months after the patient passed from our observation, the report of Wood and Garvin² prompted a review of the roentgen-ray films and led to a diagnosis of congenital polycystic disease of the right lung.

August 29, 1933, the patient returned for examination. He gave a history of having been in Colorado during the interval of approximately 13 months. Cough and expectoration had gradually grown less; he had escaped acute febrile attacks and his general condition was much better.

Upon examination it was obvious that he was somewhat less cyanotic and dyspneic. There was less evidence of moisture in the right lung, though signs of cavity formation were widely evident. In the mid-zone of the right chest there was a distinct whistling sound usually audible only upon expiration. This was probably due to air being forcibly expelled through a constricted or valve-like bronchial communication. The râles formerly present at the base of the left lung had disappeared. The right diaphragm was elevated and immobile. Apparently phrenicectomy had accomplished a great deal of good and in view of the marked improvement, thoracoplasty was not again advised.

The roentgen-rays in figure 2 are reported through the courtesy of Dr. G. Burton Gilbert of Colorado Springs. They indicate rather marked diminution in the infiltration in the lower half of the right lung, and also further clearing of the left lung. These findings are in keeping with the history and clinical manifestations reported above.

CASE II

P. C., admitted to St. Anthony's Hospital February 3, 1928, white male, aged 33, single.

Family History: Apparently negative. Past personal history uneventful.

Present Illness: About two months before the patient first noticed shortness of breath with gradual loss of voice. Because of the progressive hoarseness with both inspiratory and expiratory difficulty, laryngeal diphtheria was suspected and antitoxin given. There was no response to this treatment and after two months of increasing dyspnea and hoarseness, the patient was referred to Dr. R. M. Balyeat, of Oklahoma City, for diagnosis and treatment. The author is indebted to Dr. Balyeat for the privilege of seeing this case in consultation.

A further study of the history indicated that the patient had lost 15 or 20 pounds in weight and that he had suffered from a gradual increase in cough with the expectoration of quantities of mucoid material.

Physical Examination: Essentially negative except for those symptoms and signs referable to the thorax. The temperature was normal, pulse 86, and the blood pressure 110 mm. of Hg systolic and 80 diastolic. There was apparently some obstruction to both inspiration and expiration. The expiratory phase was prolonged. Expansion of both halves of the thorax seemed to be considerably limited; however, there was apparently some retraction of the right thorax with relative enlargement of the left.

Percussion revealed rather marked dullness over the mid-zone of the right chest with hyperresonance over the whole of the left. It was impossible to outline the normal cardiac dullness, the heart apparently being displaced to the right. There was both visible and palpable evidence of deviation of the trachea to the right.

Auscultation revealed numerous medium and coarse crackling râles over the right lung and a few similar râles at the base of the left. The breath sounds over the right side were very harsh with a low pitched tubular element. The heart sounds were apparently clear but were heard with maximum intensity to the right of the sternum.

A roentgen-ray of the chest (figure 3 A) showed areas of opacity of varying density throughout the right lung, giving the impression that the lung was extensively infiltrated and contained multiple cavities.

The left lung was approximately normal in appearance except that the hilum shadow was moderately heavy and contained a few calcified nodes. The trachea was greatly distorted and displaced to the right. At the point of maximum deviation the

proximal wall of the trachea was at least an inch and one-half to the right of the mid-line.

The heart and great vessels were also markedly displaced to the right and obscured by the general opacity.

Laboratory findings were essentially negative except for a four plus positive blood Wassermann. Sputum examinations were negative for tubercle bacilli and revealed practically nothing but mucus.

The patient remained in St. Anthony's Hospital approximately three weeks. During this time his temperature ranged from 97° to 99°. His respiratory rate varied from 18 to 32, and his pulse from 84 to 120.

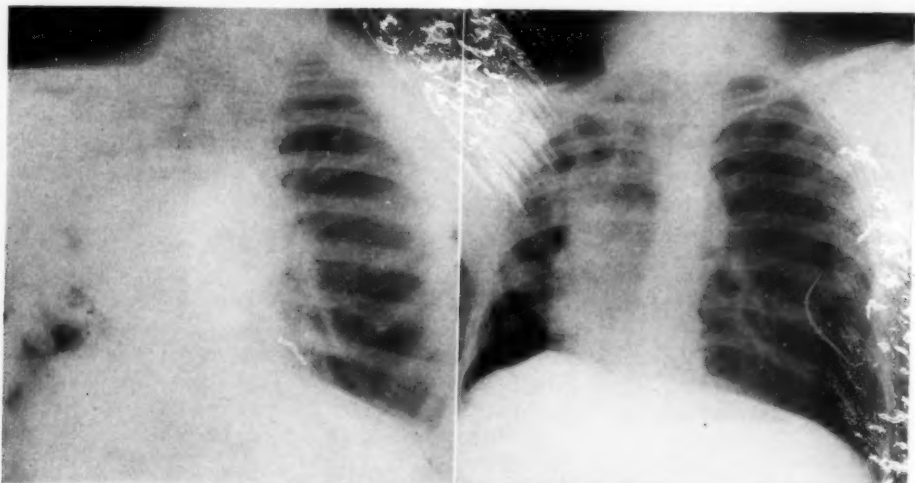


FIG. 3 *A* and *B*. (Case 2.) *A* represents a film made 2/3/28. Note the marked opacity or irregular density throughout the right lung. Also the extreme displacement of heart and trachea toward the right. *B* represents a film made 10/1/33. Note the obvious clearing of the right lung with evidence of cystic formation, especially at the right base. The position of heart and trachea are virtually unchanged.

He was placed on routine anti-luetic treatment and during his three weeks' stay in the hospital he manifested rather marked improvement, with reduction in cough and expectoration, and also some improvement in the dyspneic condition. On account of the presence of a four plus blood Wassermann, the encouraging response to anti-luetic treatment and our inability to make a definite diagnosis of the pulmonary condition, the lesions in the lung were considered as possibly luetic in origin.

Dr. Balyeat's records show that the patient was still under observation on October 4, 1928. He resumed his occupation as foreman of a pipe line crew a few months after leaving the hospital but was not wholly free from symptoms. A recent follow-up by means of a questionnaire indicates that the cough and expectoration disappeared and that the patient is following his usual occupation. The evidence also indicates that the antisiphilitic treatment was faithfully followed.

A recent roentgen-ray of the chest compared with the one made in 1928 (see figure 3 *B*) indicates marked reduction in the opacity on the right side with areas apparently free from lung markings. The largest of these areas seen at the base of the right thoracic cavity suggests the possibility of a circumscribed pneumothorax.

Since he has never had induced pneumothorax, and has had no recent symptoms suggesting spontaneous pneumothorax, it seems reasonable to attribute this finding

to cystic disease. The late appearance of symptoms does not preclude the possibility of congenital cystic disease.

A careful comparison of the two pictures reveals little, if any, change in position of the heart and mediastinal structures. This tends to support the diagnosis of congenital polycystic disease.

While we must accept the diagnosis of syphilis in this case, such a diagnosis does not necessarily explain the intrathoracic pathology. Proved syphilis of the lungs is obviously very rare. In the cases so diagnosed, the pathologic lesions as revealed by roentgen-ray studies do not closely resemble those found in the case under consideration. Neither does the roentgen-ray evidence of lung syphilis persist after treatment such as this case received. The rapid disappearance of roentgen-ray evidence in the diagnosed cases has been considered as diagnostic confirmation.

After careful consideration of the above facts, and taking into account the marked similarity of the main clinical and pathological features in this case and in the one first reported, it seems reasonable to consider this a true case of congenital polycystic disease of the right lung.

CASE III

White female, aged 22. (This case is being reported through the courtesy of Dr. J. A. Myers of Minneapolis.)

History: There is a history of repeated attacks of pneumonia, also of an attack of influenza in 1920. In May 1921, she developed a persistent cough, foul purulent sputum, and fatiguability. On March 9, 1922, the first roentgen-ray film was made (figure 4 *A*).

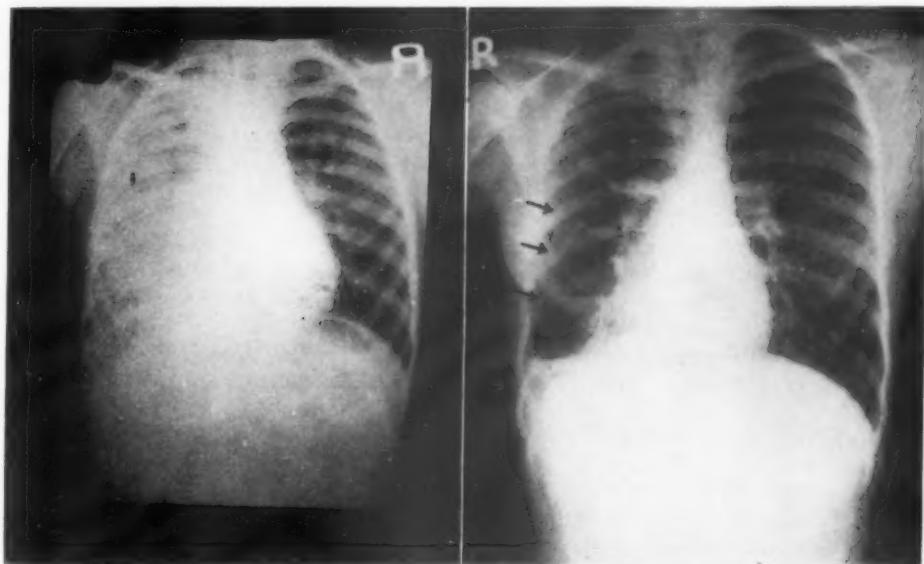


FIG. 4 *A* and *B*. (Case 3.) *A*, under date of 3/9/22, reveals evidence of extensive pathology in the right lung with widespread infiltration. *B* represents a film made 9/21/32 and is remarkable in that the opacity has almost completely disappeared, making more obvious the characteristic markings of congenital polycystic disease.

The interpretation of this film was as follows: "Extensive fibroid pulmonary tuberculosis involving the right lung with extensive cavity formation in the right

upper half of the lung field. There is a marked thickening of the pleura over the entire right chest."

Following this, she was not seen by Dr. Myers or members of his staff for a period of approximately 10 years. When again seen, investigation showed that she had continued to cough and to bring up a moderate amount of foul sputum.

The roentgen-ray diagnosis in 1922 was pulmonary tuberculosis; the subsequent history is suggestive of pulmonary abscess, and yet the patient had passed from childhood to maturity without disaster. Such a course is not in keeping with either advanced pulmonary tuberculosis or pulmonary abscess with extensive pneumonitis. Pulmonary abscess with multiple cavities is particularly prone to prove fatal or to resist all forms of treatment. The latter course is accompanied by roentgen-ray evidence of increase in the pathologic lesions.

The second roentgen-ray film, 9/21/32, presents a surprising picture (figure 4 B). It certainly does not conform to that usually found after 10 years of advanced tuberculosis or pulmonary abscess. Careful examination reveals a remarkable degree of clearing throughout the whole of the right lung field. In the lower half of the right thorax, there are three superimposed circular shadows which are fairly typical of congenital polycystic disease. About the time the second film was made phrenicectomy was performed without material benefit.

In summing up the clinical evidence in this case it should be remembered that there was a history of repeated respiratory attacks during childhood with ultimate development of persistent pulmonary symptoms and signs.

In the light of our present knowledge, the roentgen-ray findings in this case, supplemented by a respiratory history such as that reported, seem to justify its inclusion in this series as a genuine case of congenital polycystic disease of the lungs.

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MILD HYPOTHYROIDISM *

By RALPH M. WATKINS, B.S., M.D., *Cleveland, Ohio*

INTRODUCTION

THIS modest study represents the combined and correlated symptom findings of a series of 50 patients suffering with mild hypothyroidism.

It is presented with the opinion that the disease or condition or syndrome (for it probably is not a specific disease) is comparatively common. It must be overlooked often. Only two or three years' time has been necessary for me to study these and some other cases in private practice, and any disease picture which is encountered so frequently cannot be rare.

The name mild hypothyroidism is very possibly a misnomer. The thyroid is unquestionably deficient in its action, but other bodily structures also, notably the other endocrine glands, can often be proved to be abnormal in function. The association of inactivity of the thyroid gland with systemic diseases such as low grade infections, cardiovascular-renal disease, deficiency diseases, various anemias and so forth, is so well known as to need no comment. In this study the attempt has been made to avoid reporting any case history in which such afflictions as the above occur.

My view of the matter is this: There are many people, mostly women from 30 years of age onward, who present a vague, uncharacteristic, indefinite train of symptoms and signs, associated with moderate lowering below normal of the basal metabolic rate. Their ailments often are not clearly recognized, but they respond in a reasonably satisfactory manner to the administration of thyroid extract, with or without other glandular substances, plus simple hygienic medical regulations. I feel sure from my experience that non-glandular therapy alone does not relieve them.

I should like to stress particularly the following facts:

1. The clinical picture of mild hypothyroidism is vague.
2. It is often unrecognized.
3. It is often encountered.

RÉSUMÉ OF FINDINGS

In this group 84 per cent were females and 16 per cent males. Two children are included—a girl of 11 and a boy of 12. The latter, by the way, had the lowest metabolic rate of all the group (minus 40 per cent) and yet did not have the picture of true myxedema. The average age of the women was 33.4 years and of the men 35.4 years. The average metabolic rate of the 50 patients was minus 14.3 per cent.

In establishing the basal metabolic rate at the beginning of treatment, from one to five tests were made on each patient. The average for the

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whole group is between two and three tests. All the tests were made on the same apparatus and nearly all by the same technician. It seems to me that if only one basal metabolic test is made on a patient there is a definite chance of error because of transitory abnormal conditions of the patient or of the apparatus. I believe that it is better to do at least two, or preferably three, tests over a week's period, and to average the results, before coming to a decision as to the actual basal rate.

It is worth noting that, with few exceptions, the patients were of high intelligence. None was actually impoverished; many had a fair proportion of luxuries; several did responsible work.

A compilation of the symptoms reported by the patients showed that they had occurred in the following proportions:

1. Weakness, loss of muscle strength, abnormal fatigue in 54 per cent.
2. Loss of energy and of initiative in 82 per cent.
3. Nervousness in 86 per cent.
4. Increasing weight in 52 per cent; decreasing weight in 10 per cent.
5. Abnormal dryness of skin and hair in 56 per cent.
6. Menstrual disturbance in 37½ per cent. Of these, about half had gone through the menopause and the rest had a menstrual flow scantier than normal. One patient had menorrhagia.
7. Abnormal desire for sleep in 28 per cent. Unusual wakefulness in 6 per cent.
8. Mental apathy in 40 per cent.
9. Constipation in 44 per cent.
10. Abnormal gaseous eructations in 50 per cent.
11. Headaches in 20 per cent.

Physical examinations brought out the following pertinent points:

1. Overweight averaging 16.1 per cent in 54 per cent of the patients.
2. Underweight averaging 12.8 per cent in 26 per cent of the patients.
3. Normal weight in 20 per cent.
4. The thyroid gland was not enlarged in 76 per cent of the patients. Colloid goiter was present in 14 per cent, and adenomatous goiter in 6 per cent. The thyroid gland had been resected in 4 per cent.
5. The tonsils had been removed in 42 per cent; they were obviously infected in 20 per cent and were apparently normal in 38 per cent.
6. Blood pressure was below normal in 10 per cent, above normal in 4 per cent, and within normal limits in 86 per cent.
7. The pulse rate was abnormally rapid in 52 per cent, unusually slow in 4 per cent, and within normal limits in 44 per cent.
8. One hundred and twenty basal metabolic tests were carried out to establish the rates at the beginning of treatment of the 50 patients. As noted above, the average for the series was minus 14.3 per cent.
9. Associated diseases are common in hypothyroidism and unquestionably play a definite part in it at times. Fifty-two per cent of these pa-

tients had such ailments. In the group, infected sinuses, infected tonsils, dental sepsis, chronic colitis, chronic arthritis, cardiovascular-renal disease each occurred in from three to 10 instances; migraine, chronic bronchitis, phlebitis, essential hypertension, mild diabetes mellitus, endocervicitis, chronic cystic mastitis, chronic oöphoritis, prostatitis and kidney infections occurred each once or twice. I have related this for the purpose of pointing out the susceptibility of these patients to various diseases.

Study of the past histories of these patients was interesting:

1. Sixty per cent had suffered some potentially serious disease earlier in life. Ten patients had had tonsillitis, five pneumonia, five typhoid fever; there were two instances each of hyperthyroidism, cholecystitis, pulmonary tuberculosis, bronchitis, otitis media, pyelitis, phlebitis, pleurisy, and influenza. In single instances the patients reported that they had suffered in the past with colitis, migraine, pyloric stenosis, tuberculous lymphadenitis, appendicitis (without operation), diphtheria and smallpox.
2. Of the 50 patients, 30 were married women. These had had a total of 50 children, a birth rate of 1.67 per married woman.
3. It does not seem possible that there is any other group of patients suffering with a chronic disease which is subjected to so many operations as had been performed in these cases of mild hypothyroidism. Seventy per cent of these patients had undergone surgical operations. There were 26 instances of removal of tonsils or adenoids or both. There were 18 of removal of the appendix. There were scattered reports of removal of the thyroid gland, the uterus, the gall-bladder; a cystic ovary had been removed from one patient and another had been operated upon for tuberculous glands of the neck.

LITERATURE

Lawrence¹ emphasizes abnormal fatiguability of the body as a whole, or subnormal function of any of its parts as suggesting depression of thyroid activity. He goes so far as to state that marked thyroid failure can be present without the development of myxedema.

Weiss and King² remind us that swelling of the eyelids is a comparatively common finding in hypothyroidism and may be the only obvious abnormality of the patient on casual examination.

Warfield³ states that mild hypothyroidism is comparatively common among persons living in goiter regions such as the Great Lakes basin. All classes of people are affected; a considerable proportion are professional men and women. Overweight, underweight or normal weight may be found. He considers the most important single symptom, physical exhaustion which often leads to a neurasthenic state.

Thurmon and Thompson,⁴ in studying this problem, were interested to find at least 11 patients in their series who had basal metabolic rates varying from minus 11 to minus 24 and who had no complaints at all. It was only by careful study in addition to metabolic tests that the diagnosis of hypothyroidism could be maintained.

Youmans and Riven⁵ stress the fact that hypothyroidism without myxedema is a more common condition than is generally appreciated and that it has a wide distribution.

Baskett⁶ finds mild hypothyroidism comparatively common in the Mississippi basin.

Craddock,⁷ Hoge,⁸ and McKean⁹ cite many symptoms of this ailment. These include apathy, senile expression, dry skin and hair, obesity, slow pulse, slow digestion and excretion, feeling of coldness, stiffness and pain in the extremities, mental depression, fatiguability, menstrual disturbances, biliousness, feeling of inertia in the morning and of stimulation in the evening, sluggish memory, difficulty in concentration, headache, slight dyspnea, loss of libido, lowered temperature and blood pressure, a tendency for dental caries to develop, susceptibility to eczema and furuncles, falling hair, obesity in early life, susceptibility to intercurrent infections, nervousness, at times loss of weight, tinnitus, relative sterility, narrowness of the lid slits, lack of appetite, poverty of thought, lack of feeling, clumsiness. The authors state that the ratio of females to males suffering with the disease is about four to one. Laboratory findings are characteristic only in that there is some lowering of the basal metabolic rates, slight increase in the carbohydrate tolerance, mild secondary anemia with slight leukopenia and relative lymphocytosis.

Gordon¹⁰ notes the susceptibility of these patients to mild respiratory infections.

Alexander¹¹ mentions the occurrence of paresthesia and vasomotor rhinitis.

Thommen¹² reports a few obscure cases in which such conditions as menorrhagia, alopecia areata, malnutrition, albuminuria and glycosuria and chronic eczema were relieved by the use of thyroid extract.

McKinlay¹³ reports a case of unexplained secondary anemia cured by adding thyroid extract to the usual treatment.

Brown¹⁴ reports a number of patients with this disease who had a moderate gastric hypoacidity. This is a frequent finding.

Hayward¹⁵ and Woods describe two groups of these patients with regard to mental derangements; one group presented symptoms resembling those of a depressive psychosis and another, symptoms which suggested dementia precox.

Jacobi¹⁶ says that hypothyroidism is able to stir up latent schizophrenia.

Ziegler¹⁷ notes that these people show irritability and frequently hallucinations.

Vis¹⁸ links up the thyroid deficiency with that of other glands and states that the accompanying disorder in the ovaries is responsible for dysmenorrhea; in the adrenals for low blood pressure and dyspnea; in the gonads for impotence and in the parathyroids for tingling and numbness of the fingers.

Barlow¹⁹ pleads for the earlier recognition of thyroid deficiency and has an interesting observation, namely: that in many of these patients the outer one-third of the eyebrows is either gone or scanty, with the remainder of the eyebrows coarse and fan-shaped.

Sloan²⁰ notes mental subnormality following moderate lack of thyroid secretion in fetal life. These children are not necessarily cretins.

Harrell²¹ found in his series 80 per cent of the patients to be suffering from focal infection.

SUMMARY

Fifty patients, mostly females, have been studied for the purpose of demonstrating some of the salient points of mild hypothyroidism. The name of the disease may be incorrect; rather, the condition may be a syndrome in which abnormalities of other organs, besides the thyroid gland, play a part. The condition is frequently present in people of middle age. Evidences of the disease are vague in that there are no specific symptoms. Outstanding in these complaints are the indefinite loss of energy, nervousness, mental apathy, extreme fatigue, loss of muscle strength, general weakness, increase of weight, constipation and so on, of which so many women complain.

The basal metabolic rate is lowered to a point moderately below normal.

There are no characteristic findings on physical examination. Those most frequently discovered are a moderate degree of overweight, rapid pulse, normal blood pressure, unusual dryness of the skin and hair, and frequently various associated diseases usually of chronic type.

It is of some interest to note that a majority of these patients had had an abnormal number of potentially serious ailments in their earlier years.

The average number of children born to the married women of the group was well below that of the race in general.

A strikingly large proportion of these patients had been operated upon for various conditions. It is possible that many of the operations were carried out in an effort to relieve these people of their vague complaints.

CONCLUSIONS

It seems to me fair to state the following facts in regard to mild hypothyroidism:

1. The disease is unquestionably common.
2. The disease often remains undiagnosed or is improperly diagnosed for a long period of time.
3. The disease has no clear cut, specific symptoms or signs.

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THE USE OF CALCIUM ORTHO-IODOXYBENZOATE IN THE TREATMENT OF ARTHRITIS, WITH A DISCUSSION OF ITS POSSIBLE VALUE IN SOME OTHER ORTHOPEDIC CONDITIONS *

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SALTS of ortho-iodoxybenzoic acid have been used clinically in the treatment of arthritis since 1926 when Young and Youmans¹ reported the successful use of ammonium ortho-iodoxybenzoate, given intravenously, in 43 cases. Later Smith² and Cottrell³ reported some success with the oral administration of calcium ortho-iodoxybenzoate, and this rapidly became the route of choice with the medical profession due to the fact that severe general reactions often followed the intravenous use of the ammonium salt.

For two years the writer has been using calcium ortho-iodoxybenzoate as a routine procedure in an investigation comprising a portion of the arthritic cases in his orthopedic practice. This investigation consists of 282 cases. Of these, 236 (Group I) were studied in the usual clinical manner, but complete laboratory and roentgenological study was not possible in every instance. In 46 cases (Group II) the investigation was more complete in that it was possible to analyze them in greater detail with full laboratory findings. These two groups provide a peculiar method for evaluating results, in that the general group (Group I) might be said to show what improvement may be expected in that large mass of arthritic cases seen by the internist or general practitioner and treated by him in the usual manner. The smaller group (Group II), on the other hand, seems to give a more accurate method of judging the real value of the drug in cases which were disciplined to carry out the treatment uninterruptedly.

In visiting a number of rural clinics, geographically separated, it was necessary to find some form of adjuvant drug treatment which the patient could use in safety between visits and which could be counted upon, not only to relieve arthritic symptoms, but also to promote the success of other orthopedic measures (exercises, diet, appliances, etc.) which had been previously initiated.

Not only did calcium ortho-iodoxybenzoate hold out definite promise of curative results, but it also seemed suitable for the following reasons:

1. It is not related to cinchophen or other quinoline derivatives which, when used without close supervision, may cause severe allergic manifestations or hepatic damage.
2. It does not cause addiction in the patient.
3. Only occasionally do patients complain of nausea (less than 3 per cent of over 500 cases) or other gastrointestinal disturbances, following its

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ingestion. This agrees with the findings of earlier workers^{1, 2, 3} who found the drug relatively nontoxic even in massive doses.

4. Apart from the objective improvement effected, it gives the patient a subjective sense of improvement which helps him to continue with his régime.

METHOD OF TREATMENT

A standard treatment is employed for all cases whether seen in clinics or in private practice. This includes removal of foci of infection where discoverable; exercises and apparatus to improve body mechanics; body hygiene to check constipation; proper diet, and local treatment of affected joints. Arthritic vaccine (either autogenous or that made from stock strains) and thyroid extract were given to the occasional case in this series. To some patients, very small stimulating doses of sodium salicylate and potassium iodide were administered, but the majority of cases received no medication other than calcium ortho-iodoxybenzoate,* 2 grams (four tablets of $\frac{1}{2}$ gram each) daily. And here it may be noted that one should not look for any real improvement to manifest itself in less than one month. The use of the drug must be continued for a period of at least 30 days if it is to produce lasting benefit. It was in the case of patients who coöperated best in this respect that the most satisfactory results were obtained.

The following criteria for improvement were used:

<i>Subjective Symptoms</i>	<i>Objective Symptoms</i>
Pain on activity	Deformity
Pain without activity	Size of joints
Tenderness to pressure	Range of motion
Occupational usefulness	Local heat
Emotional stability	Crepitus
Appetite	Condition of tegmentum
Sleep	Improvement of foci
General well-being (as judged by patient's own opinion as to his improvement)	Change in weight

GROUP I (GENERAL STUDY)

Calcium ortho-iodoxybenzoate has been administered, as described above, to a general group (Group I) of 236 arthritic cases treated over the past two years. Practically all of these cases were complicated by general orthopedic conditions such as faulty posture, static deformities of the feet, deformities of the joints, muscle and tendon contractions, etc. Varying degrees of ankylosis or instability of the joints were also present. Most of the patients were ambulatory. The extent of deformity or crippling also spread over a wide range. Treatment previous to this investigation had been varied.

* This was supplied through the courtesy of the Smith, Kline and French Laboratories under the name of Oxo-ate "B."

TABLE I
Analysis of 46 Cases, Group 2

No.	Age	Sex	Duration in Years	Type	Degree	Duration of Use of Drug in Mos.	Improvement	Remarks
1	64	F.	3	H	Severe	August 1932-January 1934 (16 mos.)	Marked	No weight reduction effected.
2	64	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	Excellent	Definite hypertension improved.
3	35	F.	2	A	Severe	August 1932-January 1934 (16 mos.)	Startling	Totally incapacitated—back to housework.
4	42	F.	3	A	Severe	August 1932-January 1934 (16 mos.)	Marked	
5	66	F.	10	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	Definite hypertension relieved.
6	25	F.	3	A	Severe	August 1932-January 1934 (16 mos.)	Marked	Manipulation of joints now possible.
7	47	M.	6	H	Moderate	August 1932-January 1934 (16 mos.)	Excellent	Totally disabled—now back at work.
8	65	M.	7	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	Back at work.
9	50	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
10	48	F.	5	A	Severe	August 1932-January 1934 (16 mos.)	Marked	Classical deformity of spine corrected.
11	59	F.	10	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Manipulation of joints now possible.
12	50	F.	6	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Totally disabled—now back at work.
13	68	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Back at work.
14	57	F.	3	A	Moderate	August 1932-January 1934 (16 mos.)	Marked	
15	64	F.	7	H	Moderate	August 1932-January 1934 (16 mos.)	None	X-ray shows less calcium in vessel walls.
16	64	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Patient non-cooperative
17	35	F.	3	A	Severe	August 1932-January 1934 (16 mos.)	Marked	Definite hypertension improved.
18	42	F.	3	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	Back at work.
19	68	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Doing housework again.
20	25	F.	3	A	Moderate	August 1932-January 1934 (16 mos.)	Marked	Now works 14 hours a day.
21	47	M.	7	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	Back at work.

TABLE I (Continued)
Analysis of 46 Cases, Group 2

No.	Age	Sex	Duration in Years	Type	Degree	Duration of Use of Drug in Mos.	Improvement	Remarks
22	60	M.	5	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Classical deformity of spine improved. Classical deformity of spine improved. Now self-supporting. Decompensated heart condition improved.
23	55	F.	5	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
24	65	F.	5	A	Moderate	August 1932-January 1934 (16 mos.)	Marked	
25	55	F.	5	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
26	55	F.	5	H	Severe	August 1932-January 1934 (16 mos.)	Marked	None
27	65	F.	8	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
28	55	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
29	59	F.	5	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	
30	60	F.	5	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Doing housework again.
31	35	F.	3	A	Severe	August 1932-January 1934 (16 mos.)	Marked	
32	48	M.	3	A	Moderate	August 1932-January 1934 (16 mos.)	Marked	
33	35	F.	3	A	Moderate	August 1932-January 1934 (16 mos.)	Marked	
34	35	F.	3	A	Severe	August 1932-January 1934 (16 mos.)	Marked	Doing housework again. Doing housework again. Definite hypertension improved.
35	60	F.	8	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	
36	64	F.	5	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	
37	58	F.	8	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
38	25	F.	3	A	Severe	August 1932-January 1934 (16 mos.)	Marked	Fair
39	48	M.	8	H	Moderate	August 1932-January 1934 (16 mos.)	Marked	
40	62	F.	12	H	Severe	August 1932-January 1934 (16 mos.)	Fair	
41	50	F.	5	H	Moderate	August 1932-January 1934 (16 mos.)	Fair	
42	48	F.	5	H	Severe	August 1932-January 1934 (16 mos.)	Marked	Doing housework again. Doing housework again. Doing housework again.
43	59	F.	10	A	Moderate	August 1932-January 1934 (16 mos.)	Marked	
44	50	F.	8	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
45	64	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	Marked	
46	57	F.	7	H	Severe	August 1932-January 1934 (16 mos.)	None	

H—Hypertrophic arthritis

A—Atrophic arthritis

Dosage—Standard dosage, 2 grams calcium ortho-iodoxybenzoate daily.

The results may be summarized as follows:

Improvement	Number	Percentage
Marked to excellent	116	50%
Fair to good	86	36%
Slight to none	34	14%

GROUP II (SPECIAL STUDY)

In addition to this general group (Group I), 46 arthritic patients were studied over a period of 18 months with full laboratory records taken at intervals (table 1). These records included a roentgen-ray study of the left hand, left knee and the joint most seriously involved in every case. The writer expects to make a supplementary report of this phase at a later date.

Without wishing to enter into any discussion on the vexed question of nomenclature in arthritis, the writer has divided these 46 cases as follows:

Hypertrophic (degenerative) arthritis.....	32.....	70 per cent
Atrophic (proliferative) arthritis.....	14.....	30 per cent

The average age of the patients was 53 years; the average duration of the disease 5.5 years. There were 40 females and 6 males.

The clinical results may be summarized as follows:

Improvement	Number	Percentage
Good to excellent	41	89%
Fair to slight	2	4.3%
None	3	6.7%

In some of these cases the results were startling—the word is used advisedly. Patients who had been chronic invalids for months or years were restored to useful activity, wage-earning employment or the resumption of household duties. A remarkable feature was the improvement noted in hypertensive and heart conditions. In so far as the action of calcium ortho-iodoxybenzoate is as yet undetermined by the writer, it is felt that the improvement in hypertensive and heart conditions must be attributed more to the improvement in the patient's general well-being. Even so, it may be used as a criterion in summing up the value of the treatment. And here it may be reiterated that this group of patients was very carefully followed and controlled, so the results obtained were more successful than one might reasonably expect to find in the cases selected haphazard or in a general group of patients. Of course, the improvement was not due entirely to the calcium ortho-iodoxybenzoate, but the degree of improvement is measured by a comparison with a similar group of patients who did not receive the drug. This standard of comparison is already in the hands of everyone who is dealing with arthritis.

Where improvement occurred, swelling was reduced as shown by actual measurements of the affected joints, the range of motion was enlarged and the general well-being of the patient was greatly enhanced. The relief of pain was not remarkable. It may be noted that when intense discomfort

is present, calcium ortho-iodoxybenzoate may be given conjointly with salicylates or other analgesic drugs apparently without fear of incompatibility.

LABORATORY FINDINGS

Detailed laboratory tests were conducted on the above 46 patients. The results, while not particularly significant, are given because the writer feels that no preparation should be recommended until any possible untoward effects on the various systems have been investigated. Toxicity studies on other antiarthritic agents have been conducted by the writer.⁴

Test	Percentage Unchanged	Percentage Increased	Percentage Decreased
Blood calcium	26	35	39
Blood sugar	59	15	26
Basal metab. rate	39	37	24
Sedimentation rate	28	2	70
Indican output	4	96	0
R. B. C.	35	30	35
W. B. C.	11	26	63
Hemoglobin	91	2	7
Blood pressure	35	9	56
Weight	15	20	65

The maximum and minimum changes are also recorded:

Test	Maximum Increase	Maximum Decrease
Blood calcium	7- 11	13.7- 8.9
Blood sugar	85-105	140- 85
Basal metab. rate	-18-+2	-10- -38
Sedimentation rate	20- 23	45- 18
Indican output	0-+5	
R. B. C.	3,500,000-4,700,000	5,400,000-4,100,000
W. B. C.	4,800- 8,000	10,400- 6,600
Hemoglobin	80- 95	80-60
Blood pressure	110- 145	200-155
Weight	157- 161	156-112

In no case was there roentgen-ray evidence that the joint changes characteristic of atrophic or hypertrophic arthritis had progressed while the patient was under treatment. This may be of no significance, but in view of the length of time of the treatment (average 16 months), the writer views the roentgen-ray findings with optimism. So far as he knows, however, no detailed serial study of this problem has ever been undertaken and he is endeavoring at the present time to gather further information on this point. The sedimentation rate remained stationary or decreased in almost every case, which may be taken as evidence of systemic improvement. There was also a fairly constant lowering of high blood pressure in line with the improvement in hypertensive cases mentioned earlier in this article. Especially noteworthy is the material increase in indican output. This raises the fascinating theory that one of the underlying causes of arthritis may be a disturbance of the sulphur metabolism, and the writer wishes to suggest the frequent examination of the urine for indican as a means of determining, at regular intervals, whether the arthritic patient is improving

or not. He is now using this method extensively, and it is singular to note that the amount of indican found in the urine apparently gives a fair clinical index of the report which the doctor will receive from the patient on examination.

ACTION IN THE BODY

Detailed pharmacological studies would be necessary before any exact explanation could be given for the physiological effect of ortho-iodoxybenzoic acid in the body. Arkin⁵ has demonstrated the germicidal properties of this compound in the presence of blood serum. Hektoen⁶ showed that when injected intravenously, it caused a nonspecific stimulation of antibody formation in animals. Smith² points out the close structural similarity of ortho-iodoxybenzoic acid to salicylic acid, and Pemberton⁷ has described its action as that of a "glorified salicylate." Tabern⁸ gives the following explanation of its beneficial action in arthritis:

1. "It has a definite bactericidal action in the blood stream, and perhaps in infected membranes as well.
2. "It has been shown experimentally that it stimulates leukocytosis and aids antibody formation.
3. "Ortho-iodoxybenzoic acid and its salts strikingly increase the permeability of membranes.
4. "It increases lymph flow by 400 per cent.
5. "Ortho-iodoxybenzoic acid has an intense and prompt analgesic effect.
6. "It decreases muscle spasm and reduces swelling."

While not wishing altogether to take exception to the above, the writer would hazard a theory that calcium ortho-iodoxybenzoate achieves its beneficial results through its stimulating action on the peripheral circulation. With this in mind, a group of patients was selected, comprising Buerger's disease, varicose leg ulcers, and ulceration of the leg from faulty circulation in acute anterior poliomyelitis. This group was used as a yardstick to measure any possible circulatory improvement. The results obtained with these patients were so striking that the writer wishes to advance the theory that it is by the same means (i.e., stimulation of peripheral circulation) that the arthritic patient is improved. It is his intention to publish, as soon as possible, more definite data on this phase. Even now, one can say that, subjectively at least, calcium ortho-iodoxybenzoate improves circulation in the affected joints.

CONCLUSIONS

1. The beneficial effect of calcium ortho-iodoxybenzoate in a general group of 236 arthritic cases has been studied over a period of two years.
2. A more detailed study of 46 cases of hypertrophic and atrophic arthritis is also presented.
3. The therapeutic results were most satisfactory, and unpleasant side reactions were almost non-existent.

4. Laboratory findings indicate increase in indican output, improvement in hypertension and lowering of sedimentation rate.

5. A theory is advanced as to the physiological action of the drug in improving peripheral circulation.

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DR. RICHARD SHUCKBURGH AND YANKEE DOODLE *

By LOUIS H. RODDIS, F.A.C.P., Comdr. Medical Corps, U. S. Navy,
Washington, D. C.

OUR national airs and patriotic songs, like the weather, have always been considered the legitimate subject of criticism. The words are unsuitable, the music is not good, it is beyond the range of the average voice, or some other objection is advanced. No other patriotic song has come under fire more often than has the old fashioned tune and words of the Revolutionary War song, Yankee Doodle. The words are mere nonsense, say the critics, and the music is ridiculous, a mere hurdy-gurdy style of composition. Yet like many things that are nonsense—Mother Goose rhymes, for instance—it remains a popular favorite among our patriotic airs. It is the oldest of our songs of this class and has been sung for over 175 years. A song that has done this cannot be entirely devoid of merit and, furthermore, there is no evidence that its popularity is declining. The piece is really a very spirited little march of a truly martial character, and anyone who has swung along in a military formation to its bright staccato strain cannot but feel the reason for the regard in which it is held. As it was expressed as long ago as 1826:

Yankee Doodle is the tune
Americans delight in;
'Twill do to whistle, sing or play,
And just the thing for fighting.

There is a long standing controversy as to who was the author of Yankee Doodle, what were the original verses, and what was the origin of the tune. Without going into the details of this controversy, it would appear that the preponderance of evidence indicates that it was written in 1758 by a medical man, Dr. Richard Shuckburgh, a surgeon in the British Army. The music is believed to be an old jig tune well known in the eighteenth century. As originally written, it was probably intended as a good humored satire on the colonial militia who were employed in the French and Indian War and whose clumsy drill and somewhat miscellaneous attire contrasted in a marked degree with the precise manual of arms and scarlet array of the British regular troops.

In the Farmer and Moore Collections for 1824, under the title of

* Received for publication January 16, 1934.

This is the sixth of a series of portraits of medical poets. Those which have previously appeared in the ANNALS OF INTERNAL MEDICINE are:

Joseph Rodman Drake—February 1929

Oliver Wendell Holmes—June 1930

Oliver Goldsmith—May 1932

Wm. Savage Pitts—January 1933

Lieutenant Colonel John McCrae—June 1933

"Origin of Yankee Doodle" it was stated that in 1755, Dr. Shuckburgh (sic), a physician attached to the staff of General Abercrombie's army then encamped a little south of Albany, "to please Brother Jonathan composed a tune" and palmed it off on the colonial militia as a celebrated military march. The tune immediately became a favorite with the provincials. After realizing that a joke had been played upon them they enjoyed both the air and the joke, and later with a certain malicious touch they made it the popular air of the American Revolution.

Biographical facts regarding Dr. Shuckburgh are few in number. He was born in 1705. The name has led to his being described as of German extraction, but as a matter of fact he was born in the heart of England, in Shakespeare's own county of Warwick, and there is a hamlet of the name in the adjoining county of Northamptonshire. It is more than likely that he was descended from another Richard Shuckburgh, a member of the lesser gentry of Warwickshire, whose meeting with Charles I near the battlefield of Edgehill furnished the subject of a picture reproduced in Howitt's "Visits to Remarkable Places." The British army lists of the day show a Richard Shuckburgh as holding a commission dating from June 25, 1757, as surgeon in the "Four Independent Companies of Foot at New York." Shuckburgh was much interested in the Indians and in July 1759, Sir William Johnson, then the Royal Commissioner for Indian Affairs, appointed him as his secretary. Sir William mentioned in a letter of March 24, 1760, among his many qualifications for the post the fact that he had recorded all his (Sir William's) proceedings with the several nations of Indians since the opening of the last campaign. He appointed him to succeed a Captain Wraxall who had died the preceding year, but did not report his action to London in sufficient time to forestall another office seeker and a Mr. Marsh had already been selected for the post. Shuckburgh was thus "elbowed out," as he very graphically expressed it; but worse than that, as the King's Regulations did not permit him to hold two public offices at the same time, he had resigned his commission as surgeon of the Four Independent Companies and so found himself without either position. He did not get one until January 10, 1763, when he wrote Sir William as follows:

"I have completed my Purchase with the Surgeon of the Seventeenth Regiment and received my Commission from the General the 29th ult."

In 1765, he was stationed at Detroit but at the end of the year he returned to New York. Sir William Johnson who was Shuckburgh's patron and friend was an outstanding figure in colonial America. He was one of the first of our numerous "captains of industry" and "empire builders." He began as manager of estates in the Mohawk Valley belonging to his uncle, Sir Peter Warren, but bought land on his own account, building up an organization in real estate and fur trading almost as huge as some of our modern industries. Indeed, the Indians called him "Chief Big Business." He was the richest man in the colonies and as Indian agent for the British Crown exercised great influence over the destinies of the new land. The

warlike Iroquois acknowledged him as an honorary chief. He ruled the Mohawk Valley as an absolute monarch, with Johnson Hall near Albany as his palace. In every way he was a picturesque and interesting figure. He had numerous wives, mostly from the Indian tribes. He bought the first one, and later ones he did not have to buy. It was said he was the father of one hundred children, probably no exaggeration. He showed the greatest generosity and affection for them and provided lavishly for both wives and children. So colorful and influential a patron was not likely to be turned aside from any purpose and, Mr. Marsh having died, Shuckburgh was again recommended as Secretary of Indian Affairs, though he was not confirmed in his appointment until 1767. He did not surrender his commission this time until the appointment was secure. Dr. Thomas White did not succeed him as Surgeon of the Seventeenth Regiment until May 9, 1768.

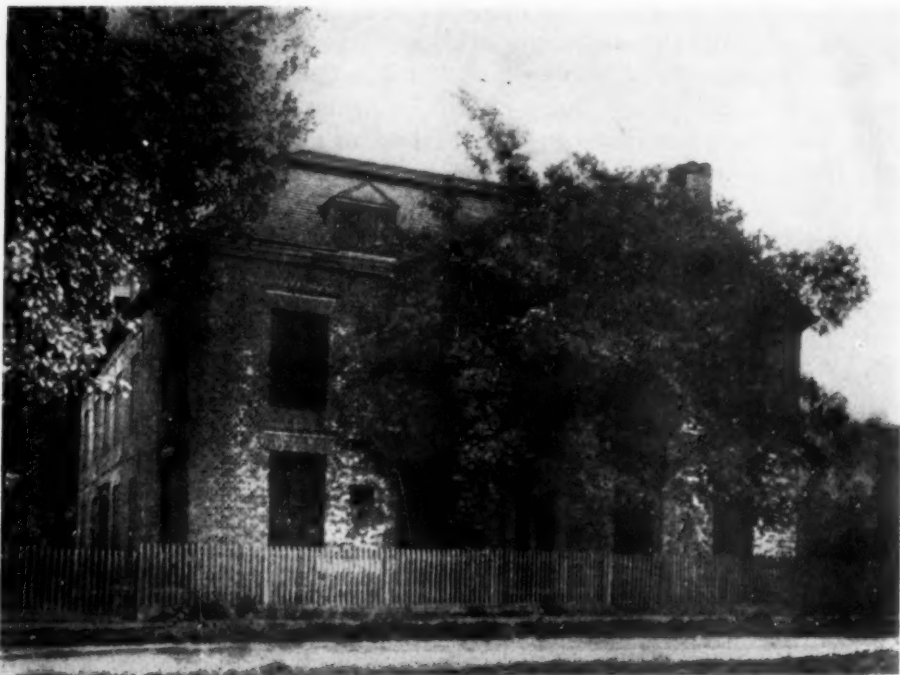


FIG. 1. The Van Rensselaer house near Albany, New York, close to site of old Fort Crailo. Here Dr. Shuckburgh is believed to have written "Yankee Doodle."

He did not long enjoy his appointment due to failing health. On December 26, 1771, Johnson in a letter to the Earl of Dartmouth speaks of Shuckburgh as "aged and of late very infirm." On August 26, 1773, the *New York Gazette* printed his obituary notice as follows:

"Died at Schenectady, last Monday, Dr. Richard Shuckburgh, a gentleman of very genteel family, and of infinite jest and humour."

He had at least two children. A notice in an Albany paper mentions the christening of a son, John, by Richard and Mary Shuckburgh on March 15, 1747. Furthermore, he mentions in his later years, in one of his letters, his satisfaction at seeing his daughter well married (to a British officer).

Of the numerous theories regarding the origin of Yankee Doodle, it suffices to say here that the most probable one is that Dr. Shuckburgh wrote some verses to an old fashioned jig tune known by various names, but most commonly called Kitty Fisher's jig, and recommended them in jest to the provincials encamped with the regulars at old Fort Crailo. The tune, to use our present song writer phrase, "caught on" and there is no doubt but that it became a very popular air throughout New England and the colonies generally.

In the *New York Journal*, October 13, 1768, there is a mention of a celebration in which the bands used the "Yankee Doodle Song" as a principal piece. James Thacher in his "Military Journal" speaks of British troops marching out in 1775 to take part in the battle of Lexington, their band playing *by way of contempt*, Yankee Doodle. The adoption of the tune as a patriotic air gave it quite another aspect, however, a charge expressed by a British officer. Thomas Aubrey says in 1777, alluding to Burgoyne's surrender: "The soldiers at Boston used it as a term of reproach but after the battle of Bunker Hill, the Americans gloried in it. Yankee Doodle is now their poem, a favorite of favorites, played in their army, esteemed as warlike as the Grenadier's March. . . . After our rapid successes we held the Yankees in great contempt, and it was not a little mortifying to hear them play this tune, when their army marched down to our surrender."

What Dr. Shuckburgh's original verses were is not now positively known. The present ones are probably of Revolutionary War origin. Dr. George H. Moore, whose research on the subject was considerable, gives the following as having been part of the Shuckburgh verses:

There is a man in our town
I pity his condition.
He sold his oxen and his sheep
To buy him a commission.

These better known verses probably appeared during the first year of the American Revolution:

Father and I went down to camp,
Along with Captain Goodwin,
And there we saw the men and boys
As thick as hasty pudding.

Yankee Doodle keep it up,
Yankee Doodle Dandy.

When his commission he had got,
He proved a nation coward.
He durst not go to Cape Breton
For fear he'd be devoured.

Yankee Doodle came to town,
Put on his striped trousers,
And vowed he couldn't see the place
There was so many houses.

The place where Shuckburgh wrote the song is better authenticated. A granddaughter of General Robert Van Rensselaer, in a letter on the subject, says:

"The story of Yankee Doodle is an authentic tradition in my family. My grandfather, Brig. Gen. Robert Van Rensselaer, born in the Green Bush Manor House, was a boy of 17 at the time when Dr. Shuckburgh, the writer of the verses, and Gen. Abercrombie were guests of his father, Col. Johannes Van Rensselaer, in June 1758. We have a picture of the old well, with the high stone curb and well sweep which has always been associated with the lines written while the British surgeon sat upon the curb."

It is known that Abercrombie was at or near Albany in the spring of 1758, preparing for the attack on Ticonderoga, and it is very likely that Dr. Shuckburgh was with him. The house, a picture of which is reproduced here, is an old brick Georgian Mansion, long known locally as Old Fort Crailo, a name received apparently from its having been built on the site of a wooden stockade erected by the settlers in 1642 as a refuge during Indian raids. It was in 1924 made a State Monument and the house is being restored and used as a museum of Revolutionary relics and materials relating to Yankee Doodle and to the medical military poet who rendered it famous. No known portrait of Shuckburgh has been brought to light, although a considerable search has been made for one.

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EDITORIAL

WILLIAM HENRY WELCH

THE death of Dr. Welch has removed from the constantly changing medical scene one to whom the historian of the last half century of American medicine must ascribe a leading rôle in the development of medical science, medical education, and public health. The promotion of these advances was indeed the main theme consistently held to through his unusually long and active life, and his accomplishments in these fields outrank in significance his numerous and important personal contributions to the subjects of Pathology, Hygiene and the History of Medicine, in each of which he successively held the professorship in The Johns Hopkins Medical School.

In his youthful days in medicine, Welch had the most intimate personal experiences with the men and the environment that constituted American medical science and medical education in that period and likewise with those who were in the forefront of European medicine of that day.

He graduated from the College of Physicians and Surgeons, Columbia, in 1875, at a time when the medical course was almost entirely didactic, when the only laboratory course was that in anatomy and when the lectures and demonstrations in physiology, pathology and materia medica were given by clinicians who took a secondary interest in these fields of science. They lectured about the achievements of others, but neither in training nor in equipment were they fitted to contribute to the advance of knowledge. Very few of the medical schools in the United States had more than a perfunctory connection with a university, and even fewer owned and controlled a hospital. Welch himself took part in this educational system as head of a "quizz" and learned from personal experience also the difficulty of combining an active interest in pathology with the practice of medicine.

From his two periods of study in Germany and Austria and his visits to medical centers in France and England, Welch derived a clear and vivid understanding of the great advantages possessed by the system of medical research and education which had developed in European countries. It was a period in which tremendous advances in knowledge were being made and one also in which the importance of science was receiving practical recognition from universities and states in the form of special laboratories and equipment which enabled the masters in each field to devote all their time to their subjects and to gather about them assistants and students to aid in carrying forward their work. It was a golden age for the workers in these laboratories linked in a close camaraderie of enthusiasm and gathering with new tools and methods a rich harvest from relatively virgin fields.

Welch first went abroad for study in 1876. He had already while an intern in Bellevue Hospital under Delafield developed an interest in pathology

through the performance of a considerable number of autopsies and it was natural that he should desire to round out this experience by a period of study under Virchow, the master of cellular pathology. To acquaint himself first with histology, he worked for a semester under Waldeyer at Strassburg. There also he took a course under Hoppe-Seyler and Baumann in what was then the only existing laboratory for research in physiological chemistry. Later Welch was accepted as a student by Ludwig, whose laboratory or institute of physiology in Leipzig was in those days the most important center of research in this subject. It was Ludwig who at the end of the semester advised Welch to continue his pathological studies under Cohnheim at Breslau, rather than in Virchow's institute. Cohnheim was the coming master of general or functional pathology. In his laboratory were Weigert, Ehrlich, Albert Neisser, Salomonsen and others marked for brilliant future careers. Welch witnessed there the historic incident of Koch's demonstration of the anthrax bacillus. His own problem was the pathogenesis of pulmonary edema, and he carried out a clear and logical series of experiments which led to his publication of his theory of the causative influence of disproportionate action of the two ventricles.

The eight months with Cohnheim were the high point of Welch's first two years abroad, though after this he worked with Chiari in Vienna and von Recklinghausen in Strassburg and visited in Paris and London before returning to New York in 1878.

From this first journey he came home not only abreast of his day in knowledge of pathology and the technic of pathologic research but with a clear conception of the necessity of an adequate laboratory and of students to progress in this field of science. He had come home with a program. The first step to its fulfillment was made possible by an offer from Bellevue Medical College of three rooms for a laboratory of pathology, the first of its kind in this country. Six lean years followed, in which to earn a necessary living he devoted part of his time to running a student "quizz" and part also to clinical practice. It was a test of his fidelity to science, and that he triumphed is shown by the success of his department of pathology and the number of students from various schools who came to attend his courses.

At the end of that time he was invited to become Professor of Pathology in The Johns Hopkins University and pathologist to The Johns Hopkins Hospital. The medical school had not yet been organized and the Hospital was still in the process of construction, but the University had already made a name as a home for science, and Welch did not hesitate to accept the opportunity.

Before moving to Baltimore, however, he spent another year abroad which was to prove even more significant to his future than his first visit there. This time he went to acquaint himself with the rapidly developing science of bacteriology. In that crowded year he learned technic from Frobenius, studied hygiene in von Pettenkofer's institute and under Flügge.

animal pathology under Kitt, and finally bacteriological methods under Koch himself. It was a "golden decade" in the history of medicine, a decade which saw the discovery of the tubercle bacillus, the bacillus of typhoid fever, the causative agents of pneumonia and of Asiatic cholera. "Those who did not live through that period," said Welch in later years, "can hardly realize the thrill and enthusiasm attending the unlocking of the great secrets of the causation and spread of that most important group of human diseases, the infectious diseases." The close contact he enjoyed with the great figures of those days not only stimulated his own productiveness in the field of bacteriology but awoke early his realization of the great importance of preventive medicine and hygiene.—He had added another feature to his program.

Within a matter of months it will be fifty years since Welch came to The Johns Hopkins University and the man and the opportunity were joined. In that time American medical science, medical education and public health have experienced a development which in its rapidity and extent is unparalleled. We have attained a parity and in certain respects have surpassed the attainments of those European nations which a half century ago were so immeasurably our superiors in these fields. The full history of these crowded years remains to be written. Many forces contributed to produce this result, but it is certain that no other man exerted such a guiding influence upon the course of events as William Welch.

In attempting now at the completion of his career to assay the significance of its different phases, we come to feel that the chief value of his active years as Professor of Pathology and as first Dean of the Medical School of The Johns Hopkins University lay in the demonstration furnished by his department and the whole school of the results that might be expected from a university type of medical education.

Welch had played a large rôle in the selection of the clinical faculty and later of the heads of the departments of preclinical sciences. The roll of names, Osler, Halsted, Kelly, Abel, Mall, and Howell, testify to the wisdom shown in their selection. The plan of organization of the Medical School which was adopted was drawn up by Welch. It created a sensation in the medical circles of those days, and it is a measure of the distance we have come that today it would be accepted as a matter of course.

That the Hospital should be a part of the Medical School was provided in the will of its founder, and that the Medical School should be an integral part of the University had also been decided. It was considered revolutionary, however, that the requirements for admission to the Medical School should include a collegiate degree with required work in fundamental science and a reading knowledge of French and German. "At present," said Welch in an address in 1893, "no medical school requires for admission knowledge approaching that necessary for entrance into the freshman class of a respectable college; many schools demand only the most elementary education, and some require no evidence of any preliminary education

whatever." The medical course in the new school was to occupy four full years. The amount of didactic teaching was to be minimal and the larger amount of time was to be spent in practical work in the laboratories and in the wards of the hospital. The occupants of the chairs of anatomy, pharmacology and physiology were to devote all their time to teaching and research, and research was recognized as an essential aid in teaching. In the enunciation of almost every one of these principles new ground was broken.

It remained to justify by works the soundness of these principles and this was done in full measure. Within a few years the success of the new school was assured by the constant output of its important scientific and clinical publications, the enthusiasm of its undergraduate and graduate students and by the tendency evident throughout the better schools to adopt many of the features of its program. Welch's share in this success was a very large one. These were the years of his most active work in pathologic investigation and as a teacher of pathology. His studies of thrombosis and embolism, hog cholera, the etiology of pneumonia, his identification with Nuttall of the gas forming bacillus (*B. welchii*) may be selected from over 300 titles for special mention. But the output of trained pathologists from Welch's laboratory was even more important, for many of these men were destined to carry not only his instruction in pathology but his educational ideals into a large number of the medical schools of the country. The list of professors of pathology who had been students of Welch is too long for citation. In 1914 there were 113 graduates of The Johns Hopkins Medical School who held professorial chairs throughout the country and many hundreds more, of course, engaged in teaching. Before the foundation of The Johns Hopkins, other schools, notably Harvard under President Eliot and the University of Michigan under Angell, had achieved significant advances in standards, but it had remained for The Johns Hopkins under the guidance of Welch, unhampered by tradition, to overwhelmingly demonstrate the success of a university type of medical school and through the influence of its graduates to play the major rôle in stimulating a general elevation in standards.

In the accomplishment of this beneficent revolution, many factors played a part. It would have been impossible without the establishment within this period of the great philanthropic foundations and the stimulation to large individual gifts for construction and endowment. The action of the medical profession itself through the American Medical Association in establishing standards and grading existing schools in accordance with these standards, and finally the raising of educational prerequisites by the state licensing boards, were all essential steps in the great advance.

It was natural, however, with so much activity in this field that the opinion of Welch should have been frequently sought. Those who thus came to Baltimore were impressed not only with the breadth of his knowledge but equally with his insight into practical difficulties. His influence

grew also because there was no bitterness in his spirit and no fanaticism in his advocacy of new methods. He deplored the utterances and actions of some of his disciples who could see no good in the past and who stirred up conflict by their slurs upon the motives of all who opposed them. There was a breadth and equanimity to Welch's personality which set him apart.

Such calls for advice became so numerous and insistent that he was gradually forced out of active work in pathology and into the position of unofficial consultant to innumerable enterprises whose aim was the betterment of medical education. It is probably this phase of Welch's career which contains his greatest contribution, but so modestly and so quietly did he carry his share in the labors of those days that the history of his influence upon events is as yet largely unwritten. Few institutes or departments for medical research were founded in the early part of this century without Welch having contributed from his wide experience either to their form of organization or to their selection of personnel. The policies formulated by the trustees of great endowments to apply to the betterment of humanity have in a large number of instances derived their inspiration, if not their actual wording from counsel that was sought and obtained from Welch.

His relations to the General Educational Board and to the Rockefeller Foundation were exceedingly close. He was the President of the Board of Scientific Directors. His wide knowledge of the various fields of medical science; his extensive personal acquaintance with men and with their work and his flair for practical affairs enabled him to exert great influence in determining the direction of the efforts and the recipients of the benefactions of this great foundation. Thus it came about that in time he played a part vicariously in health surveys and campaigns for health in many foreign lands and that he had the satisfaction of seeing American aid extended to institutions for medical research and education in some of those European countries to which he had gone as a student.

One of the important features of the change in medical education upon which Welch had laid great stress was the full time principles as applied to the preclinical sciences. That the development of science in this country was greatly advanced by the widespread adoption of this part of Welch's program there can be no doubt. Its success led him and many others to consider the application of the same rule to the heads of the clinical departments, and since 1914 a number of schools including The Johns Hopkins Medical School have instituted full time chairs of medicine, surgery, and of some of the other leading clinical departments. The success of this new departure has perhaps not been as striking as that which attended the earlier improvements in the organization of medical schools, but that in some modified form it will persist seems evident.

Welch had from the first a deep interest in the broader aspects of public health and preventive medicine. He gave very freely of his time to many of the great movements in this field which originated at the beginning of this century. In Baltimore he took an active part in local health problems

and as President of the State Board of Health he acquired practical experience with the details of health administration and with the formulation of state laws dealing with health problems. He served as Chairman of the first International Congress of Tuberculosis held in this country in 1908, and was a frequent visitor to such congresses abroad. Welch considered that the greatest coming medical advances were to be in the field of prevention. This aspect of his interests eventually led to the formation of the School of Hygiene and Public Health at The Johns Hopkins University, which was organized according to a broad program outlined by Welch and for which he selected the personnel. He himself was its first head and saw it through the first years of its existence. Its influence on the standards of public health education in this country and on research in problems of hygiene and public health may in time equal that exerted earlier in other fields by the school of medicine.

Welch withdrew from the direction of the School of Hygiene, but it was not in order to retire. At the age of seventy-six he turned his unquenchable energy into the accomplishment of an earlier dream, the foundation of a Department of the History of Medicine. It is housed today in a noble building, the William H. Welch Library. He spent several happy years collecting personally in the bookshops of Europe some of the treasures now on the library shelves, and then as the shadows of his final illness began to gather he turned over the direction of the Department to an able successor, Professor Sigerist.

Few men have been more honored in their life time than Welch, perhaps in part because he himself never sought prominence and public honors; and was known for the unselfishness of his interests. He was devoted not only to his ideals of science and education but also to the welfare of those men who were advancing these ideals. Many men of prominence in medicine owe their first step from obscurity to the helping hand of Welch. It came about quite naturally that the plan for an international celebration of his eightieth birthday should have been taken up with enthusiasm throughout the medical world. Its focal point was the great gathering in Memorial Continental Hall in Washington where a distinguished audience, including the President of the United States as one of the speakers, rendered homage to the accomplishments and the personality of this great American man of Science.

Virchow, whose career is in some ways similar to that of Welch, once wrote: "There are also those who if they do not create the current, still give to it its direction and force. These men are not always the happiest. Many go down in the movement, or by it. Many grow weary after they have given to it their best forces. Much power and great tenacity are necessary if the individual shall not only live to see his triumph but also to enjoy it." That necessary power and tenacity were preëminent in Welch. His addresses in the period of the opening of The Johns Hopkins Medical

School contain his program of medical education; it will be found again unchanged by those who read his address at the opening of the Medical School of the Duke University, forty years later. This program was an adaptation of the educational methods he had found in Europe. Welch diverted this current of progress into American channels and gave it its force. His fairness, his wisdom founded on his historical perspective and knowledge of men, and his lack of selfish ambition spared him the bitterness of personal opposition, so that he lived still unwearied to see his triumph and also to enjoy it.

REVIEWS

Human Sex Anatomy. By ROBERT LATOU DICKINSON, M.D., F.A.C.S. viii + 145 pages; 24 × 30 cm. The Williams and Wilkins Company, Baltimore. 1933. Price, \$10.00.

As is implied by the title, the chief function of this book is to serve as a topographical atlas for those who are interested in the study of the generative organs of the two sexes. However, the first 150 pages of this volume are given over to text in which the author frankly discusses human sexual relations from the point of view of physiology as well as that of anatomy.

Dr. Dickinson emphasizes the fact that there is an art of sexual intercourse, a fact most men do not appreciate. He points out that it is just as important for marital happiness that the woman obtain full sexual gratification from coitus as it is for the husband. The author offers suggestions that may prove helpful in bringing about this end. Physicians are apt to examine women complaining of sexual difficulties for such gross anatomical defects of the genitalia as imperforate hymen and absence of the vagina, but often they do not realize the part that minor variations in the size of the genitalia of the two sexes may play in sexual incompatibility. Gynecologists and the medical profession as a whole will find the discussion in the first part of this book of help in treating women complaining of dyspareunia and of lack of sexual feeling.

The drawings that make up the larger part of the volume are based on numerous carefully taken measurements of the various parts of the genitalia of the two sexes. Because these measurements were taken on living subjects rather than from cadavers, this atlas is of special value. Great pains have been taken to make the illustrations accurate.

As has already been said, at least a few of the many facts brought out by the author will doubtless prove of value to the clinical gynecologist. However, the main use for this very complete atlas will probably be as a reference book which anatomists and physiologists studying problems of the generative tract may consult with profit.

L. B.

Heredity and Environment; Studies in the Genesis of Psychological Characteristics.

By GLADYS C. SCHWESINGER and FREDERICK OSBORN, American Museum of Natural History. 484 pages. The Macmillan Company, New York. 1933. Price, \$4.00.

This book, written by experienced clinical psychologists, is not intended for light reading, but as a reference work it is of great value. As the authors state: "This volume was prepared as part of an attempt to appraise the present status of knowledge in the field of eugenic research."

No attempt is made to persuade the reader to become a convert to either the thesis of heredity or environment. But arguments from both schools are presented fully, and copious references are given. In the six chapters and appendix the topics of Measurement of Intelligence, Measurement of Personality, Definition of the Heredity and Environment Problem, A Study on Genetic Factors and Stated Environmental Differences as They Affect the Development of Intelligence, and Viewpoints of Personality are discussed.

The final conclusions set down by the authors are well taken: "The extreme conclusions frequently voiced by some 'Environmentalists' on the one hand or by the extreme 'Hereditarians' on the other, do not find justification in the facts. They exceed the limits set by the studies already available which no thoughtful student can

longer afford to ignore: The evidence that there are important differences among individuals in heredity capacity for intelligence, is entirely conclusive; the variabilities and averages of large numbers of individuals under influences of varying environments are in process of being quite accurately determined."

J. L. McC.

Phyloanalysis: A Study in the Group of Phyletic Method of Behavior-Analysis. By WILLIAM GALT, M.A.; with a preface by TRIGANT BURROW, M.D. 151 pages. Baker and Taylor Co., New York. 1933. Price, \$1.00.

This small book presents a very interesting discussion of certain aspects of experiments in organic psychiatry as based on observations that have to do with the physiological reactions of man as they are expressed subjectively or in the sphere of his own feelings. The author claims that "the place occupied by this field of investigation in respect to man's behavior-disorders is analogous to the place occupied by bacteriology in relation to structural medicine"; and he further states that "phyloanalytic technic does not represent so much an effort to prove the existence of something as to note the existence of impediments."

J. L. McC.

COLLEGE NEWS NOTES

GIFTS ACKNOWLEDGED

Acknowledgment is made of the following donations by members to the Library of the College by the authors:

Dr. Howard F. Root (Fellow), Boston, Mass.—1 monograph, "The Association of Diabetes and Tuberculosis";

Dr. Myrton S. Chambers (Fellow), Flint, Mich.—1 reprint;

Dr. Arthur H. Jackson (Associate), Washington, Conn.—1 reprint;

Dr. Alfred J. Scott, Jr. (Fellow), Los Angeles, Calif.—2 reprints.

NEW LIFE MEMBER

Dr. James Murray Washburn, Chicago, Ill., became a Life Member of the College on April 20, 1934.

Sir Aldo Castellani (Fellow), Director of the Ross Institute of Tropical Hygiene, London School of Hygiene and Tropical Medicine, has returned to New Orleans to begin his duties as Professor of Tropical Medicine at the Louisiana State University Medical Center. Dr. Castellani will spend a part of each year at the University.

Dr. Lawrence Kolb (Fellow), U. S. Public Health Service, is in charge of the new U. S. Hospital for Defective Delinquents at Springfield, Mo. The hospital will be used only for prisoners over whom the Federal Government has assumed jurisdiction. It is considered an essential unit in the government's attempt to specialize the treatment of persons committed to its care. It will serve as the medical center for the entire federal penal system. The center will accommodate 705 patients; it is located on a site consisting of 445 acres donated by citizens of Springfield, Mo.; it consists of eight buildings, erected at a total cost of over two million dollars.

An informal social luncheon of the Fellows of the American College of Physicians residing in North Carolina was held at Pinehurst on May 2, 1934, with Dr. Charles H. Cocke, Governor of the College for North Carolina, presiding. Twenty-four Fellows were present, including the following Officers of the North Carolina State Medical Society:

Dr. Isaac H. Manning, Chapel Hill, outgoing President;

Dr. P. P. McCain, Sanatorium, the newly installed President;

Dr. Paul H. Ringer, Asheville, President-Elect;

Dr. Robert L. Felts, Durham, First Vice-President; and

Dr. L. B. McBrayer, Southern Pines, Secretary-Treasurer.

At the 37th annual meeting of the American Gastro-Enterological Association at Atlantic City, May 1, Dr. B. B. Vincent Lyon (Fellow), Philadelphia, was elected President. Dr. Chester M. Jones (Fellow), Boston, was elected Second Vice-President, and Dr. Russell S. Boles (Fellow), Philadelphia, was reelected Secretary.

Dr. Howard F. Root (Fellow), Boston, Mass., addressed the Scranton County Medical Society, Scranton, Pa., on "Practical Problems in Diabetes" on May 1. He also gave a two-hour clinic at the Scranton State Hospital on "Dietary Treatment in Diabetes" the same day.

Dr. Robert A. Peers (Fellow), Colfax, Calif., was unanimously chosen President-Elect of the California Medical Association at its recent annual meeting held in Riverside.

Dr. Oliver T. Osborne (Fellow), New Haven, Conn., is the author of an editorial entitled "Clinical Histories" published in the *Medical Record* of May 16, 1934.

Dr. Herbert L. Bryans (Fellow), Pensacola, Fla., was chosen President-Elect of the Florida Medical Association at its 61st annual meeting held in Jacksonville, April 30 to May 2, 1934.

Dr. Bryans is also President of the Florida Heart Association, and Vice-President of the Emory Medical Alumni Association of Florida.

Dr. Walter L. Bierring (Fellow), Des Moines, Iowa, delivered the oration in medicine, entitled "Diagnosis of Heart Disease: Historical Development of Its Recognition," before the Illinois State Medical Society's 84th annual meeting at Springfield, May 15 to 17.

The American Academy of Tropical Medicine was organized in Washington during February, under the auspices of the National Research Council. Dr. Charles F. Craig (Fellow), New Orleans, was elected Vice-President, and Dr. Earl B. McKinley (Fellow), Washington, was elected Secretary. The aim of the Academy is "to stimulate interest in all phases of tropical medicine, to provide current surveys of work in progress, to coördinate American work to prevent duplication, to function as a central source of information for investigators, to coöperate with other agencies in the same field and to receive and administer funds through grants for specific projects."

Honorary degrees were conferred at the centennial celebration of Ohio State University College of Medicine, at Columbus, March 1 to 3, on Dr. Torald H. Sollmann (Fellow), Dean, Western Reserve University School of Medicine, Cleveland; Dr. William S. McCann (Fellow), Director of the Department of Medicine, University of Rochester School of Medicine, Rochester, N. Y.; and Dr. Henry S. Houghton (Fellow), Director of the University Clinics, University of Chicago.

Dr. Joseph F. Bredeck (Fellow), St. Louis, Mo., gave one of the evening addresses in connection with the Graduate Course and Clinic Conference held in St. Louis, May 21 to 26, under the auspices of the St. Louis Clinics.

Dr. Walter C. Alvarez (Fellow), Rochester, Minn., was a guest speaker at the 153d annual meeting of the New Hampshire Medical Society, held in Manchester, May 15 to 16.

Dr. Jonathan C. Meakins (Fellow), and Dr. James B. Collip (Fellow), both of Montreal, were guest speakers on the occasion of the 7th annual "Postgraduate Day" of the Mahoning County Medical Society, Youngstown, Ohio, on April 28.

Dr. W. McKim Marriott (Fellow), St. Louis, Mo., was the guest speaker on the occasion of the annual meeting of the Oklahoma Pediatric Society on May 21 at Tulsa.

Dr. Judson Daland (Fellow), President of the Philadelphia Institute for Medical Research, discussed plans of the Institute and its organization at a special meeting of the Philadelphia County Medical Society, April 30.

Dr. Leonard G. Rowntree (Fellow), Director of the Institute, spoke on "The Accruing Effects of Thymus Extract (Hanson) on Growth and Development in Successive Generations of Rats."

Dr. E. B. Krumbhaar (Fellow), Dr. Leonard G. Rowntree (Fellow), Dr. William D. Stroud (Fellow), and Dr. James B. Wolffe (Associate), were among those who gave demonstrations of methods of diagnosing and treating heart disease under the auspices of the Philadelphia Heart Association, May 15 to 18.

At the 53d annual session of the South Dakota State Medical Association at Mitchell, May 14 to 16, the following were among the visiting physicians addressing the meeting:

Dr. Francis E. Seneor (Fellow), Chicago, "Modern Treatment of Syphilis";

Dr. Fred M. Smith (Fellow), Iowa City, "Peptic Ulcer";

Dr. Albert M. Snell (Fellow), Rochester, Minn., "Unusual Clinical Pictures Associated with Common Duct Stone";

Dr. Frederick A. Willius (Fellow), Rochester, Minn., "Treatment of Congestive Heart Failure."

Dr. Lea A. Riely (Fellow), Oklahoma City, Okla., addressed the 68th annual session of the State Medical Association of Texas at San Antonio, May 14 to 17, on the topic "Diabetic Problems."

Dr. David J. Davis (Fellow), Chicago, was elected Vice-President of the Society of Medical History of Chicago on May 2.

Dr. Frederick T. Lord (Fellow), Boston, Mass., has been elected President of the Massachusetts Tuberculosis League.

Dr. Alexander B. Moore (Fellow), Washington, D. C., will deliver the first of the Russell D. Carman Memorial Lectures in radiology at the meeting of the Minnesota State Medical Association at Duluth, July 16.

Dr. Charles H. Marcy (Fellow), Pittsburgh, Pa., was a guest speaker at the annual meeting of the Virginia Tuberculosis Association at Richmond, April 5, his subject being "Tuberculosis in the Negro."

ABRIDGED MINUTES OF THE BOARD OF REGENTS

CHICAGO, ILLINOIS

April 15, 1934

The Board of Regents of the American College of Physicians met and was called to order at the Palmer House, Chicago, Ill., at 2:40 p.m., April 15, 1934, by the President, Dr. George Morris Piersol.

The following members of the Board of Regents were present: Dr. George Morris Piersol, Dr. Charles G. Jennings, Dr. Jonathan C. Meakins, Dr. William D. Stroud, Dr. William Gerry Morgan, Dr. James S. McLester, Dr. James Alex. Miller, Dr. Sydney R. Miller, Dr. David P. Barr, Dr. Arthur R. Elliott, Dr. James B. Herrick, Dr. Clement R. Jones, Dr. S. Marx White, Dr. Walter L. Bierring, Dr. John H. Musser, Dr. O. H. Perry Pepper, Dr. Francis M. Pottenger, Dr. Luther F. Warren, Dr. Maurice C. Pincoffs, and Mr. E. R. Loveland, Executive Secretary.

The Executive Secretary acted as Secretary of the meeting.

An abstract of the Minutes of the previous meeting of the Board of Regents, held at the College Headquarters, Philadelphia, Pa., December 3, 1933, was read and approved.

The Executive Secretary stated that he had received a communication from Dr. Noble Wiley Jones regretting his inability to attend because of the sudden illness of his father; also one from Dr. James H. Means stating that he would arrive on Thursday. With the permission of the Board, the presentation of other communications was deferred until later, due to the pressure of more important matters to be covered first.

President Piersol expressed his appreciation of the effort made by the Regents and Officers to come to the meeting a day previous to the opening of the regular Session. He also reported upon the preparation of the program of General Sessions.

Dr. James B. Herrick, General Chairman of the Eighteenth Annual Clinical Session, reported upon the work of himself and his committees. Dr. Arthur R. Elliott, Chairman of the Committee on Clinics, likewise presented the report of the work of his committee.

The Executive Secretary reported that the Ellis Research Laboratories of Chicago had applied for exhibit space and had made the usual deposit of \$10.00, but that the Committee on Exhibits had withheld their approval of the proposed exhibit of this firm. The Ellis Research Laboratories refused to accept this decision and filed suit, charging breach of contract. The Executive Secretary immediately employed the counsel that represents the American Medical Association. The court upheld the right of the College to refuse exhibits not acceptable to its Committee.

Upon motion by Dr. Herrick, seconded by Dr. Pottenger and unanimously carried, it was

RESOLVED, that the action of the Executive Secretary in the above matter be approved and the expenditure of such moneys as are necessary to satisfy the attorney's fee be authorized.

Preceding a report from the Committee on Specialization, Dr. Walter L. Bierring, who has attended various meetings of the Council on Education of the American Medical Association and other groups investigating a plan for the certification of specialists, reported that an organization was effected on February 11, 1934, known as the National Advisory Board for the Medical Specialties, comprising the four specialty boards now organized in ophthalmology, otolaryngology, obstetrics and gynecology, and dermatology. In addition, there is represented the National Board of Medical Examiners, the Federation of State Medical Boards and the Association of American Medical Colleges. In the selection of officers, the President, Dr. Louis B. Wilson, was taken from the Association of American Medical Colleges; the Vice President, Dr. J. S. Rodman, from the National Board of Medical Examiners; and the Secretary, Dr. Titus, from the Board of Obstetrics and Gynecology. On the Executive Committee, there was selected a representative from the Board of Otolaryngology, from the Board of Ophthalmology and from the Board of Dermatology. Their Constitution provides that no constituent member of the National Advisory Board shall be governed in its own organization by the action of this Board. The Board is purely an advisory one concerning itself with the determination of new specialty boards as to whether they are properly qualified and represent, in each instance, the national association in the particular specialty, and the section in the American Medical Association.

After these boards are organized and functioning, a register is to be maintained through the office of the American Medical Association in which certificate-holders will be recorded. The question of whether such organizations as the College of Surgeons and the College of Physicians should enter into this work was discussed, and it seemed the wisdom of most of those present that this new advisory board should concern itself entirely with the qualifications of specialists in the more strict sense. Dr. Bierring's impression from the meeting on February 11 was that an examining board in internal medicine, considering the broad field

that is covered by that subject, would be inadvisable, but that the separate Colleges might set up as one of their qualifications for admission a definite qualifying examination.

On the other hand, a board is to be established for the pediatricians, on which the American Academy of Pediatrics, the American Pediatric Association and the Section on Pediatrics of the American Medical Association will have representation. When such a body sets up a board, and that is considered a specialty, Internal Medicine might be considered also as a specialty. Dr. Bierring suggested that for the present, the American College of Physicians may be interested in this new movement, and possibly be prepared to give advice, if called for, but that it should not take an active part in the matter of the qualifications of specialists. He further expressed the opinion that the College should have some form of examination for admission, adopted after the plans of the older Colleges on the Continent.

Dr. James S. McLester also commented upon the manner in which the work of the National Advisory Board for the Medical Specialties would work. At the present time, the American Medical Association publishes in its Directory, opposite any man's name, the specialty that he claims. When the various examining boards begin to function, the American Medical Association presumably will take the results of these examinations for designation of specialties. The Council will be guided largely by the advice of the National Advisory Board as to the character of examinations and as to whether these certain examining boards are conducting the examinations in such a manner that their certificates can be accepted. The Council will be guided also by advice from other sources, if necessary, and they do not bind themselves always to accept the advice of any particular organization. The National Advisory Board will have as one of its chief functions the coordination of the work of the special societies.

Dr. McLester further pointed out that it is relatively easy to organize this sort of work for the otolaryngologists, ophthalmologists, gynecologists and obstetricians, but the work of organizing examinations for the surgeon and for the internist is a much more difficult matter, because of the greater breadth of the examination.

The report from the Committee on Specialization was postponed until the next meeting of the Board of Regents.

Dr. Sydney R. Miller, Chairman of the Committee on Credentials, presented candidates for Associateship and Fellowship, whose credentials had been carefully reviewed and whose election was recommended to the Board of Regents. (The complete list of elections, consisting of 96 Associates and 65 Fellows, was published in the May issue of the ANNALS OF INTERNAL MEDICINE.)

The report of the Committee on the John Phillips Memorial Prize was presented by its Chairman, Dr. David P. Barr, and was as follows:

"The Committee recommends that the Board of Regents authorize the preparation of a medal to be known as the 'John Phillips Memorial Award for Outstanding Achievement in Medicine,' this medal to be awarded at intervals on recommendation of the Committee and with the approval of the Board of Regents.

"Inasmuch as the annual expense after the initial preparation of the medal will not exceed \$200.00, the Committee ventures to suggest that the College extend its activities in two directions:

"(a) By establishing a Convocational lectureship, the lecturer to receive no honorarium but to have his expenses paid by the College.

"(b) By establishing a Fellowship in the amount of \$1800.00 to be known as the 'Research Fellowship of the American College of Physicians' and to be awarded each year on the recommendation of the Committee and the approval of the Board of Regents."

There was general discussion of the recommendations of the Committee by Dr. James Alex. Miller, who considered the recommendation as being in the line of progress, looking toward the stimulation of research rather than simply a cash recognition of something that had already been accomplished; by Dr. Jonathan C. Meakins, who referred to the original John Phillips Memorial Award as a recognition for medical research and expressing the opinion that the College would do well, if its financial condition permits, to foster research; by Dr. William D. Stroud, who stated that the income from the Endowment Fund is at present adequate to provide for the carrying out of the recommendations of the Committee.

On motion made by Dr. O. H. Perry Pepper, seconded by Dr. S. Marx White and regularly carried, the report of the Committee on the John Phillips Memorial Prize, including the recommendations, was adopted.

Secretary-General Morgan reported the following life membership subscriptions having been received during 1934:

Samuel E. Thompson, Kerrville, Tex.
Philip H. Jones, New Orleans, La.
Philip I. Nash, Brooklyn, N. Y.
E. Moore Fisher, Washington, D. C.
Frederick O. Fredrickson, Chicago, Ill.
Jabez H. Elliott, Toronto, Ont.

The Secretary-General also reported the following deaths since the last meeting of the Board of Regents, December 31, 1933:

Fellows:

A. D. Dunn, Omaha, Nebr.	January 8, 1934
Adrian H. Grigg, Beckley, W. Va.	January 6, 1934
George T. Harding, Jr., Worthington, Ohio	January 18, 1934
Albert Hoff, North Bend, Nebr.	January 27, 1934
George G. Hunter, Los Angeles, Calif.	December 12, 1933
Frank Chambliss Johnson, New Brunswick, N. J.	January 1, 1934
Julian T. McClymonds, Berkeley, Calif.	December 4, 1933
George E. McKean, Detroit, Mich.	February 4, 1934
Paul E. McNabb, Manila, P. I.	February 24, 1934
Roger S. Morris, Cincinnati, Ohio	March 1, 1934

Associates:

Joseph Bringham, Felton, Del.	February 6, 1934
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Secretary-General Morgan further reported that a Committee was appointed at the last meeting of the Board of Regents to consider the advisability of having a suitable certificate prepared for our Life Members and, in the event that its preparation seems advisable, to suggest the type and wording of the certificate. The Committee recommended to the Board of Regents the adoption of a certificate and presented a suggested form which, after discussion by the Board of Regents, was directed to be revised and presented at the following meeting of the Board.

Secretary-General Morgan explained to the Regents an inadvertence on his part as signing as Secretary-General of the American College of Physicians a telegram to the House Judiciary Committee in connection with a bill on birth control.

Dr. Walter L. Bierring presented the following resolution, which was seconded by Dr. White and unanimously adopted:

RESOLVED, that it be recorded in the Minutes of this meeting that the explanation given by Dr. William Gerry Morgan of the incident concerning his signature as Secretary-General of the American College of Physicians to a telegram to the House Judiciary Committee in connection with one of the hearings on the birth control bill be accepted as entirely satisfactory, and that an expression of fullest confidence on the part of the Board of Regents in Dr. Morgan, in constantly guarding the interests of the College, be also recorded.

Adjournment.

ABRIDGED MINUTES OF THE BOARD OF REGENTS

CHICAGO, ILLINOIS

April 17, 1934

The second meeting of the Board of Regents of the American College of Physicians met and was called to order in the Palmer House, Chicago, Ill., April 17, 1934, at 12:45 o'clock, President Piersol presiding.

The following were present: Dr. George Morris Piersol, Dr. Charles G. Jennings, Dr. Jonathan C. Meakins, Dr. William D. Stroud, Dr. William Gerry Morgan, Dr. William J. Kerr, Dr. James Alex. Miller, Dr. Sydney R. Miller, Dr. David P. Barr, Dr. James B. Herrick, Dr. Clement R. Jones, Dr. S. Marx White, Dr. Walter L. Bierring, Dr. John H. Musser, Dr. O. H. Perry Pepper, Dr. Francis M. Pottenger, Dr. Luther F. Warren, Dr. Maurice C. Pincoffs, Dr. Ernest B. Bradley, Dr. Charles F. Martin, Chairman of the Finance Committee, and Mr. E. R. Loveland, Executive Secretary.

Upon motion made by Dr. Musser, seconded by Dr. Warren and carried, the reading of the Minutes of the last meeting was dispensed with.

Dr. James Alex. Miller presented the following report of the Committee on Specialization.

"The Committee on Specialization has carefully considered the suggestion that the American College of Physicians might establish a National Examination Board for the certification of specialists in internal medicine, similar to such boards already established for other special branches of medicine.

"It is the opinion of your Committee that at the present time the establishment of any such Board is neither feasible nor desirable. From its consideration of this question, however, your Committee has reached very definite conclusions looking forward toward more adequate and rigid requirements for admission to Fellowship and Associateship in the College.

"We beg leave to offer to the Board of Regents the following recommendations directed toward that end:

"(1) That in addition to the present requirements for Associateship those candidates who have been approved by the Committee on Credentials be required to pass a written examination in internal medicine.

"(2) That this examination be prepared by a special examining committee and that opportunity be offered for the examination to be taken at numerous convenient points throughout the country, the sealed papers to be returned to the examining committee who would then recommend the successful candidates to the Regents for election to Associateship.

"(3) That an examination fee of \$10.00 be required for taking this examination, which fee would be deducted from the regular initiation fee in the case of successful candidates upon their election to Associateship.

"(4) If the Board of Regents approves this examination plan in principle it is recommended that a new committee be appointed to work out the details of such a plan and report at the next meeting of the Board of Regents. Your Committee suggests that it would be proper and desirable to have the Committee on Credentials represented upon such a committee, and also that it would be desirable to have the personnel of the committee so composed that it would represent Fellows not connected with teaching institutions, as well as those who are so connected.

"(5) Your Committee further suggests that if such a proposed written examination plan be adopted, and is successful, that at some later date an additional clinical examination for candidates for Associateship might possibly be required, open to those who have passed the written test.

"(6) Your Committee also suggests that similarly at some later date it might be desirable to consider the requirement of an examination for promotion from Associateship to Fellowship.

"Your Committee wishes to express its obligation to Dr. Walter L. Bierring for his valuable counsel in the preparation of this report.

Respectfully submitted,

J. C. MEAKINS
J. H. MUSSER
J. A. MILLER, *Chairman.*"

Upon motion by Dr. White, seconded by Dr. Barr and regularly carried, it was RESOLVED, that the above report of the Committee on Specialization be adopted.

President Piersol stated that his interpretation of the report is that the Board of Regents go on record as being in favor of this modification of our rules, in principle. The details of how this matter may be accomplished must be left to a committee to be appointed by the incoming President, this committee to consider the matter in detail and to report back to the Board of Regents at their next meeting.

Dr. James Alex. Miller suggested that it may be possible that the committee, after going into the details more thoroughly, may report back a plan which may not be feasible, but it seems to his Committee that the principle of adding to the College requirements in some such way should be most carefully studied and a detailed plan submitted.

Dr. Charles F. Martin, Chairman of the Committee on Finance, presented the report of that Committee, including the presentation of the operating statements for 1933, the budgets for 1934 and certain adjustments to provide for necessary additional appropriations to cover the Research Fellowship to be established by the College, the preparation of the John Phillips Memorial Medal and certain salary adjustments of employees. A part of the report follows:

"The Finance Committee, in submitting the detailed statement of the receipts and expenditures for 1933, as also the budget for 1934, is pleased to be enabled to report a very sound condition of the finances of the College. It desires further to express its satisfaction and appreciation of the successful financial operations as conducted by the Executive Secretary's Office, and by the officers associated with the ANNALS OF INTERNAL MEDICINE.

"The Finance Committee also recommends to the incoming Finance Committee that following the recommendation of the auditor that securities be separated between those which would be assigned as endowment fund and those which belong to the general fund, and that in the future these lists of securities be kept separate.

"In addition, the Finance Committee also recommends to the incoming Finance Committee that an analysis of the present list of securities be made and that they secure from competent authorities recommendations for any changes that may be desirable for action on the part of the Board of Regents or the Executive Committee."

The recommendations of the Committee on Finance, on motion regularly seconded and carried, was unanimously approved.

Dr. Maurice C. Pincoffs, Editor of the ANNALS OF INTERNAL MEDICINE, reported

briefly on his work as Editor during the past year. He said the number and character of manuscripts coming to the Editor's office have shown certain fluctuations during the past six months. The number of incoming manuscripts fell off sharply during the last three months, averaging not as many as ten a month, which is less than the average number printed in each issue. This state of affairs, however, remedied itself without any action on the part of the Editor, so that he now is well supplied with material for several months to come.

Dr. Pincoffs pointed out that the size of the journal has shown no essential variation in recent months, although its total size for Volume VI, ending June 1933, was slightly larger than any previous volume. He referred the Board of Regents to the analysis of the journal as prepared by the Executive Secretary and appearing among the financial reports, showing that there has been a steady growth in circulation with no recession at any time. With the election of new members to the College at this meeting, the circulation will be again increased.

Dr. Pincoffs, in further referring to the financial report on the *ANNALS OF INTERNAL MEDICINE*, stated that a new contract with the printer, beginning July 1, 1934, will be at a rate of approximately 10 per cent higher than previously, due to the increased cost entailed by the Code for the Graphic Arts, but that both he and the Executive Secretary recommended to the Board the continuance of the present printer, feeling that the increased cost is entirely justified.

Dr. Pincoffs then reported as Chairman of the Committee on the Annals, which consisted of himself as Editor, Dr. David P. Barr, Dr. O. H. Perry Pepper and Dr. James H. Means. The report of his Committee follows:

"The Committee on Annals recommends that the Committee from the Board of Regents be continued as at present constituted, with its present functions. Those functions, as stated in the original motion that provided for the Committee, are that this Committee shall be especially interested in the general policy of the Annals, its financial setup and its relation to the public. The Committee is also to aid and counsel the Editor in general about the quality of material published in the journal.

"The Committee on the Annals further recommends that the present Editorial Council be dismissed from service, and that there be constituted a Board of Associate Editors, to be composed of at least five members, and that the Editor be given the privilege of nominating to the Board of Regents the membership of this Board of Associate Editors."

Upon motion by Dr. O. H. Perry Pepper, seconded by Dr. David P. Barr, and regularly carried, the report of the Committee on the Annals was adopted.

Dr. Pincoffs then stated that he would like to make the following nominations to the Board of Associate Editors, submitting them to the Board of Regents for their approval. His nominations, not entirely selected from the membership of the Board of Regents, were:

David P. Barr, St. Louis, Mo.
Robert A. Cooke, New York, N. Y.
James H. Means, Boston, Mass.
O. H. Perry Pepper, Philadelphia, Pa.
Gerald B. Webb, Colorado Springs, Colo.

Dr. Pincoffs stated that he had not had an opportunity to communicate with them to determine their willingness to serve, but expressed the wish to have the approval of the Regents for their appointment, if they will serve.

Upon motion by Dr. Bierring, seconded by Dr. Jennings, the nominations of the above Board of Associate Editors were approved.

The appended report of the Treasurer was submitted by Dr. Stroud, copies of the report being distributed to all members of the Board of Regents.

Upon motion made by Dr. James Alex. Miller, seconded and regularly adopted, the report of the Treasurer was received and placed on file.

Dr. William Gerry Morgan, as Chairman of the Committee on the Life Membership Certificate, presented the following report:

"The Committee recommends the preparation of a suitable Life Membership Certificate of the American College of Physicians, and submits herewith the following suggested form:

"LIFE MEMBERSHIP CERTIFICATE
of
THE AMERICAN COLLEGE OF PHYSICIANS

Whereas

has fulfilled the requirements of the By-Laws, Rules and Regulations of the College appertaining to life membership, he is herewith declared a Life Member.

"In witness whereof the seal of the College and the signatures of the proper Officers are hereunto affixed this _____ day of _____, A.D. 19—.

President
Secretary-General"

SEAL

Adoption of the report was moved by Dr. Musser, seconded by Dr. White and unanimously carried.

Dr. Ernest B. Bradley, Chairman of the Board of Governors, reported briefly on the work of the Board of Governors, and stated that they had raised the question concerning the attitude of the Board of Regents in regard to membership of certain Mexican physicians and internists and members of the medical fraternity in Cuba.

Dr. Bradley said he had consulted the By-Laws and saw no objection to additional members being elected from those countries, provided they meet the requirements.

The Board of Governors recommended to the Board of Regents that some arrangement be made whereby members from Mexico and Cuba could be brought into the College. By referring to the By-Laws, Article IV, Section 1, it was noted that provision is already made for the election of Governors from countries outside of the United States, and, therefore, no action by the Board of Regents was necessary on the recommendation of the Board of Governors.

The Executive Secretary presented a number of communications and special cases dealing with requests for reinstatement, extension of time to qualify for Fellowship, resignations and cases concerning fees and dues.

By resolution regularly adopted, Dr. I. Warner Jenkins, Waco, Texas, was reinstated to Fellowship in the College.

By individual resolutions regularly adopted, the following resignations were accepted:

Fellows:

Lewis W. Elias, Asheville, N. C.
Howard T. Phillips, Wheeling, W. Va.
S. J. Wolfermann, Fort Smith, Ark.

Associates:

James J. Gable, Norman, Okla.
Wallace T. Partch, Oakland, Calif.
L. C. Sams, Dallas, Tex.
Frank E. Sayers, Terre Haute, Ind.

The Executive Secretary presented mimeographed lists of members who are two or more years delinquent, and who are, therefore, subject to being dropped from the rolls of the College, in accordance with the By-Laws, Article XIII, Section 2.

He stated that the list had been reviewed with members of the Board of Governors, and that, after careful consideration, some members of the Board of Governors wished to communicate further with these delinquent members in their districts, and, therefore, suggested the following resolution, which was regularly adopted:

RESOLVED, that all members whose names appear on the delinquent list of two or more years' standing be automatically dropped in accordance with the By-Laws, if, after further notification, their delinquent dues are not paid within the next thirty days.

The Executive Secretary then presented a second list containing the names of Associates who have not qualified for Fellowship in the required period of five years. In several instances the Governors have recommended that the names be dropped, but in other instances Governors have requested extension of the time.

President Piersol expressed the opinion that the By-Laws explicitly state that if an Associate does not qualify for Fellowship within five years, he is automatically dropped.

Upon motion by Dr. Sydney R. Miller, seconded by Dr. Morgan and regularly adopted, it was

RESOLVED, that the provisions of the By-Laws be adhered to, and that any Associates who have failed to qualify for Fellowship be dropped from the roll.

President Piersol announced the receipt of a letter from the Association of Medicine of the French Language of North America, suggesting that a representative of the College be sent to the Congress to be held in Quebec in August.

Upon motion by Dr. Herrick, seconded by Dr. Musser and regularly adopted, it was

RESOLVED, that Drs. Meakins and Martin be the accredited delegates to represent the College.

President Piersol read a communication from Dr. LeRoy S. Peters, Governor of the College for New Mexico, suggesting a succession in meeting dates of certain national societies.

Upon motion by Dr. James Alex. Miller, seconded by Dr. White and regularly adopted, it was

RESOLVED, that the communication of Dr. Peters be referred, without recommendation, to the Committee on Arrangements for the next Clinical Session.

Dr. Meakins read a communication from the Milbank Memorial Fund regarding a study to be made of physicians' incomes for which the Milbank Fund offered to make certain money grants to carry on the investigative work.

After a thorough discussion, it was moved by Dr. Sydney R. Miller, seconded by Dr. Warren and regularly carried that it be

RESOLVED, that the proposal that we coöperate with the Milbank Fund in this economic investigation be declined, as it is foreign to the purposes and policies of the College.

Dr. Pepper suggested that the incoming officers and the Executive Secretary consider the possibility and advisability of a closer spacing of the several meetings of the Regents during the Annual Session, and asked whether the Sunday meeting could not be held on Monday morning.

President Piersol said that the meetings of the Regents had been arranged in such a manner as to conflict as little as possible with the general program, and had been spaced according to the needs for carrying out the requirements of the By-Laws. That is, it is always necessary to have an early meeting of the Board of Regents to take care of elections to membership, and it is also necessary to have a late meeting of the Board of Regents, after the Annual Business Meeting, to care for the reorganization for the new year. The matter, however, shall be referred to the incoming officers for the next year.

PRESIDENT PIERSOL: "Before we adjourn, as this will be the last time when I will have the distinction of presiding over this body, I want to take this occasion to express to you my very sincere appreciation for the help and forbearance you have shown to me during the affairs of the last year."

Adjournment.

AMERICAN COLLEGE OF PHYSICIANS

TREASURER'S REPORT FOR THE YEAR 1933

Gentlemen:

It is with much satisfaction that I am able to report that the College was able to keep within its budget during the year 1933 and end the year with a surplus of \$5,801.06. For this accomplishment we are mainly indebted to our Executive Secretary. This is especially true when we consider that for the year 1933 dues were reduced approximately 25 per cent and the number of incoming Fellows was limited through the change in the By-Laws requiring new candidates to be presented first for Associateship.

The cash balance on December 31, 1933 was \$55,545.82, of which \$11,900.00 still remains in closed banks in Pittsburgh. We believe, on good authority, in time all of this money will accrue to the College.

The resources of the College as of December 31, 1933 amount to \$123,987.03. Of this \$54,010.00 is in the endowment fund and \$69,977.03 in the general fund. Our investments as of December 31, 1933 cost \$63,675.01. These securities were valued on April 16, 1934 at \$62,726.00.

During January 1934, upon authorization of the Board of Regents, and with the approval of the Finance Committee, twenty United States Government 4¼'s—3¼'s bonds and five Dominion of Canada 4's bonds were purchased from our general fund so that our total investments to date are valued at \$87,726.00.

Based upon the receipts for January and February 1934, and the attendance at the 18th annual session with the large number of exhibitors, and considering the number of new Fellows elected, it is the opinion of your Treasurer that the College can be financially maintained within the estimated budget of \$52,610.50 for the year 1934 and that our income will be more than adequate.

At the request of your Treasurer Mr. Loveland has made an analysis of our financial situation as of December 31, 1933. Such an analysis follows.

Respectfully submitted,

(Signed) WILLIAM D. STROUD,
Treasurer

THE AMERICAN COLLEGE OF PHYSICIANS

FINANCIAL ANALYSIS

1933

To the Board of Regents:

The auditor's report of his examination of the accounts of the College is hereto attached. The statements disclose a surplus of \$5,801.06, of which \$5,266.06 was added to the General Fund and \$535.00 was added to the Endowment Fund. Our estimated surplus at the beginning of the year, as submitted to the Board of Regents, was \$5,142.50, which is \$658.56 less than the actual surplus. Although the budget for 1933 was closely limited, the business of the College was not only carried on within the budget but with a little to spare.

The surplus for the previous year, 1932, was \$10,598.08. However, for the year 1933, it is proper to point out that the income was greatly reduced for the following reasons:

(1) Dues were reduced approximately 25 per cent.

(2) The change in the By-Laws, requiring new candidates to be presented first for Associateship, has greatly reduced the number of possible candidates for Fellowship for 1933, with the consequent reduction in the income from initiation fees. Whereas the 1931 income from Fellowship initiation fees amounted to \$18,365.00, the income from that source for 1933 amounted only to \$2,856.68. Due to an increasing number of Associates becoming eligible for advancement to Fellowship, it is believed that the income from initiation fees will increase in the future.

(3) During 1933, the Board of Regents held no meeting between the Montreal Clinical Session and December 3. The new members elected on December 3 came into the College as of January 1, 1934, so far as fees and dues were concerned, for it would not have been seemly to charge them dues for 1933 which was practically at an end.

(4) Financial stringencies of the times were responsible for a reduction in the number who subscribed to life membership. For illustration, in 1931 income from subscriptions to life membership amounted to \$2,400.00, in 1930 to \$3,100.00, whereas the amount received for 1933 was only \$535.00.

(5) Income from bonds and income from interest on bank balances have been reduced due to default by the City of Detroit on \$2,000.00 of bonds we own and due to banks discontinuing to pay any interest whatsoever on bank balances on deposit since the bank holiday in March 1933.

The ANNALS OF INTERNAL MEDICINE shows a distinctly improved financial condition. Our printing costs were very materially reduced after the new printers were selected, beginning July 1933. These advantageous prices still obtain, but there is a possibility of increased costs due to the N. R. A. code for the graphic arts. The income from subscriptions fell off during 1933 due to expirations of direct subscriptions (non-member subscriptions) which we could not renew, presumably due to economic conditions. The income from advertising, though very slightly higher than for 1932, is the largest in the history of the Annals.

During 1933, \$8,000.00 (par value) in securities were matured, and \$6,097.50 reinvested in securities. The total holdings in securities, all bonds, on December 31, 1933, amounted to \$63,675.01.

The cash balance on December 31, 1933, was \$55,545.82, of which \$11,900.00 remained in closed banks. During 1933, \$6,411.79 was repaid by closed banks.

A condensed comparison of income and expenditures for 1932 and 1933 follows:

<i>General Fund</i>		1932	1933
<i>Income</i>			
Annual Dues		\$27,718.00	\$20,069.80
Initiation Fees		10,275.00	2,856.68
Income from Endowment Fund		2,365.79	1,360.66*
Income from Other Securities		540.64	616.66
Interest on Bank Balances		381.16	243.28
Other Miscellaneous Income		396.81	269.11
		<u>\$41,677.40</u>	<u>\$25,416.19</u>
<i>Expenditures</i>			
Annual Clinical Session (San Francisco)			
Total Expenses	\$18,094.16		
Less Income from			
Exhibits	\$4,609.73		
Guest Fees	875.00	5,484.73	\$12,609.43
Annual Clinical Session (Montreal)			
Total Expenses	\$10,820.58		
Less Income from			
Exhibits	\$4,192.21		
Guest Fees	374.50		
Banquet Balance	293.32	4,860.03	\$ 5,960.55

* For 1933, the cost of awarding the Phillips Memorial Prize was deducted from the income from the Endowment Fund. This was not done for 1932; hence, the variance in amount.

ANNALS OF INTERNAL MEDICINE (1932)

Income		
Subscriptions	18,062.13	
Advertising	4,536.84	22,598.97
Total Cost	22,402.70	— 196.27*

ANNALS OF INTERNAL MEDICINE (1933)

Income		
Subscriptions	17,785.81	
Advertising	4,540.20	22,326.01
Total Cost	19,540.36	— 2,785.65*

Executive Secretary's Office (Including College Headquarters, Committees, Regents)	17,299.02	14,805.02
Directory (Supplement only for 1932)	727.19	1,614.00
Miscellaneous	527.62	556.21
	<u>\$32,054.32</u>	<u>\$20,150.13</u>

Endowment Fund

Life Membership Fees	\$ 975.00	\$ 535.00
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Your Executive Secretary's office has been conducted conservatively. Expenditures have been curtailed wherever possible. The office staff was reduced to two assistants for the latter part of 1933. A further reduction in the rental of the College headquarters has been obtained, beginning February 1, 1934.

The budgets herewith submitted for 1934 have been carefully estimated.

Respectfully submitted,

(Signed) E. R. LOVELAND,
Executive Secretary

April 15, 1934.

AMERICAN COLLEGE OF PHYSICIANS, INC.

BALANCE SHEET, DECEMBER 31, 1933

Assets

Cash:		
In Banks and on Hand	\$43,645.82	
In Closed Banks:		
Bank of Pittsburgh	\$5,847.87	
Exchange National Bank, Pittsburgh	2,040.74	
Highland National Bank, Pittsburgh	4,011.39	11,900.00
		\$ 55,545.82
Accounts Receivable		207.90
Investments at cost, as annexed		63,675.01
Accrued Interest on Investments		911.55
Inventory of Keys, Pledges and Frames, at cost		319.96
Deferred Expenses, 18th Annual Clinical Session		2,436.27
Furniture and Equipment, at cost	3,882.15	
Less, Allowance for Depreciation	1,992.60	1,889.55
		<u>\$124,986.06</u>

Liabilities

Deferred Income:		
Advance Collections for Exhibits, Eighteenth Annual Clinical Session	\$ 577.97	
Advance Subscriptions for Volumes VIII and IX, ANNALS OF INTERNAL MEDICINE	421.06	999.03
		<u>\$123,987.03</u>

* Profit.

Funds

Endowment Fund, as annexed	\$54,010.00	
General Fund, as annexed	<u>69,977.03</u>	<u>\$123,987.03</u>

General Fund

For the Year ended December 31, 1933

Balance, December 31, 1932	\$64,810.97	
Less:		
Transfer to Endowment Fund of the Initiation Fee of one new Life Member	100.00	
	<u>\$64,710.97</u>	
Add:		
Net Income for the year, as annexed	5,266.06	
Balance, December 31, 1933	<u>\$69,977.03</u>	

Endowment Fund

For the Year ended December 31, 1933

Principal Account:		
Balance, December 31, 1932	\$53,375.00	
Add:		
Life Membership Fees received during 1933	535.00	
Transfer of Initiation Fee of one new Life Member from General Fund	100.00	
Balance, December 31, 1933	<u>\$54,010.00</u>	
Income Account:		
Income from Securities (Endowment Fund only)	\$ 2,385.86	
Less:		
Award of the John Phillips Memorial Prize and expenses of the recipient incident thereto	1,025.20	
Balance, Transferred to Operations for the Period	<u>\$ 1,360.66</u>	

INCOME AND EXPENSES

For the Year ended December 31, 1933

Income

Annual Dues	\$20,069.80	
Initiation Fees	2,856.68	
Income from Endowment Fund (Net, after deducting Phillips Prize) ..	1,360.66	
Income from other Securities	616.66	
Interest on Bank Deposits	243.28	
Profit from Sale of Keys, Pledges and Frames	137.38	
Profit, Credit Balance on Foreign Exchange (net)	126.12	
Receipts from 1931-32 Directory	1.75	
Profit on Maturities of Securities (net)	2.96	
Receipts from Annals of Clinical Medicine90	\$25,416.19

Expenses

Seventeenth Annual Clinical Session

Income:		
Exhibits (net)	\$ 4,192.21	
Guest Fees	374.50	
Banquet Profit	293.32	4,860.03
Expenses:		
Salaries	2,937.02	
Communications (Postage, Telephone, etc.)	443.95	
Office Supplies and Stationery	64.24	
Forward	3,445.21	4,860.03

Brought Forward	3,445.21	4,860.03
Printing	1,222.82	
Traveling Expenses	4,076.69	
Miscellaneous:		
Advertising	\$ 148.00	
Badges	339.85	
Ladies Committee	256.35	
Presidential Reception	195.00	
Smoker	228.00	
Rental of Equipment	227.68	
Reporting	252.94	
Scientific Exhibits	101.99	
Other Miscellaneous Items	326.05	2,075.86
Net Expenses of Clinical Session		5,960.55

ANNALS OF INTERNAL MEDICINE

Income:

Subscriptions:

Volume I	10.85	
" II	6.85	
" III	13.85	
" IV	22.05	
" V	34.18	
" VI	912.64	
" VII	16,785.39	17,785.81

Advertising (net)

Volume VI	2,317.26	
" VII	2,222.94	4,540.20
		22,326.01

Expenses:

Salaries	\$ 4,940.51	
Communications (Postage, Telephone, etc.)	959.66	
Office Supplies and Stationery	245.23	
Printing	13,227.45	
Traveling Expenses	41.40	
Miscellaneous	126.11	19,540.36

Net profit on ANNALS OF INTERNAL MEDICINE 2,785.65

Total Income \$28,201.84

Executive Secretary's Office

Expenses:

Salaries	\$ 8,118.86	
Communications (Postage, Telephone, etc.)	1,548.32	
Office Supplies and Stationery	328.47	
Printing	170.91	
Rent and Maintenance	2,889.77	
Traveling Expenses	1,190.25	
Annual Audit	200.00	
Fee to Custodian of Securities	94.86	
Miscellaneous	263.58	14,805.02

ANNALS OF INTERNAL MEDICINE

Distributed Free to Life Members	168.00	
1933 Directory	1,614.00	
Depreciation on Furniture and Equipment	388.21	22,935.78

Net Income for the Year Ended December 31, 1933 \$ 5,266.06

INVESTMENTS

December 31, 1933

Par Value	Bonds	Cost
\$ 4,000	Canadian National Railway, 4½s, 1956	\$ 3,930.00
5,000	Canadian National Railway, 5s, July 1, 1969 }	7,042.50
2,000	Canadian National Railway, 5s, Oct. 1, 1969	
2,000	Canadian National (West Indies), SS. Co., 5s, 1955	2,040.00
2,000	City of Covington, Ky., 4¾s, 1946	2,134.01
2,000	City of Detroit, Mich., Lighting, 4¾s, 1944	2,010.40
2,000	City of Detroit, Mich., Street Ry., 4¾s, 1949	2,025.26
2,000	City of Houston, Texas, School District, 4¾s, 1942	2,077.50
2,000	City of Los Angeles, Calif., Sewage Disposal "B," 5s, 1943	2,158.24
1,000	City of Montreal, Canada, 5s, 1956	1,071.30
2,000	City of Newark, N. J., Series 2, 4½s, 1944	2,075.00
10,000	City of Philadelphia, Pa., 4½s, 1949-79	10,225.00
2,000	City and County of San Francisco, Calif., Fire Protection, 5s, 1941	2,137.12
2,000	City of Seattle, Wash., Light and Power, 4¾s, 1957	1,995.00
2,000	City of Toronto, Canada, Local Improvement, deb. 5s, 1936	2,020.00
500	Oklahoma Gas and Electric Co., deb. 6s, Series "A," 1940	487.50
2,000	Port of New York Authority, Interstate Bridge, Series "B," 4½s, 1952	2,042.20
2,000	Port of New York Authority, Interstate Tunnel, Series "E," 4¾s, 1958	2,065.40
2,000	Province of Alberta, Canada, deb. 4½s, 1956	1,896.00
2,000	Province of Ontario, Canada, deb. 4½s, 1942	2,015.00
1,000	Province of Ontario, Canada, deb. 5s, 1942	1,052.26
2,000	U. S. Treasury, 4s, 1944-54	1,998.13
9,000	U. S. 4th Liberty Loan, 4½s, 1938	9,177.19
<u>\$62,500</u>	Total (Annual Yield, 4.47%)	<u>\$63,675.01</u>

ABRIDGED MINUTES OF THE BOARD OF REGENTS

CHICAGO, ILLINOIS

April 20, 1934

The third meeting of the Board of Regents of the American College of Physicians met and was called to order in the Palmer House, Chicago, Ill., at 12:40 o'clock, President Jonathan C. Meakins presiding.

The following were present: Dr. Jonathan C. Meakins, Dr. James Alex. Miller, Dr. James H. Means, Dr. William D. Stroud, Dr. William Gerry Morgan, Dr. George Morris Piersol, Dr. William J. Kerr, Dr. G. Gill Richards, Dr. David P. Barr, Dr. Arthur R. Elliott, Dr. Clement R. Jones, Dr. S. Marx White, Dr. Francis M. Pottenger, Dr. Luther F. Warren, Dr. Ernest B. Bradley, Dr. Maurice C. Pincoffs, and Mr. E. R. Loveland, Executive Secretary.

Mr. Hennessey of the Chicago Association of Commerce expressed the appreciation of his organization to the College for holding its Annual Session in Chicago.

President Meakins spoke briefly of his plans for the period of his Presidency, expressing the hope that the work might be carried on successfully and that he might have the cooperation and aid of the Board of Regents. He welcomed to the Board a new member, Dr. G. Gill Richards, who had been elected at the General Business Meeting of the preceding day.

Upon motion regularly seconded and adopted, the reading of the Minutes of the previous meeting was dispensed with.

Upon motion by Dr. White, seconded by Dr. Barr and regularly carried, it was RESOLVED, that Dr. William D. Stroud be reelected as Treasurer for 1934-35.

Upon motion by Dr. White, seconded by Dr. Bradley and regularly carried, it was

RESOLVED, that Dr. William Gerry Morgan be reelected as Secretary-General for 1934-35.

Upon motion by Dr. Barr, seconded by Dr. Bradley and regularly carried, it was

RESOLVED, that the following members be elected to the Executive Committee:

Walter L. Bierring, Des Moines, Iowa
 James H. Means, Boston, Mass.
 Maurice C. Pincoffs, Baltimore, Md.
 Francis M. Pottenger, Monrovia, Calif.
 Roger I. Lee, Boston, Mass.

These elected members, with the President, President-Elect, Secretary-General and Treasurer constitute the Executive Committee for 1934-35.

Upon motion by Dr. Means, seconded by Dr. Morgan and regularly carried, it was RESOLVED, that Dr. George Morris Piersol serve as a member of the Committee on Credentials for three years.

President Meakins made the following appointments to committees:

Committee on Finance

Roger I. Lee (to serve until 1937)

The Finance Committee for 1934-35 is composed of the following:

Charles F. Martin, Chairman, Montreal, Que.
James Alex. Miller, New York, N. Y.
Roger I. Lee, Boston, Mass.

Committee on Public Relations

James F. Churchill (to serve until 1938)
Ernest B. Bradley (to serve until 1936)

The Committee on Public Relations for 1934-35 consists of:

James Alex. Miller, Chairman, New York, N. Y.
Ernest B. Bradley, Lexington, Ky.
James F. Churchill, San Diego, Calif.
Charles G. Jennings, Detroit, Mich.

Ex Officio

Jonathan C. Meakins, Montreal, Que.

Committee on Annals of Internal Medicine

O. H. Perry Pepper (to serve until 1937)

The Committee on ANNALS OF INTERNAL MEDICINE for 1934-35 consists of:

Maurice C. Pincoffs, Chairman, Baltimore, Md.
David P. Barr, St. Louis, Mo.
James H. Means, Boston, Mass.
O. H. Perry Pepper, Philadelphia, Pa.

Committee on the John Phillips Memorial Prize

David P. Barr, Chairman, St. Louis, Mo.
Arthur R. Elliott, Chicago, Ill.
O. H. Perry Pepper, Philadelphia, Pa.
James H. Means, Boston, Mass.
William J. Kerr, San Francisco, Calif.

Committee on Constitution and By-Laws

Alfred Stengel (to serve until 1937)

The Committee on Constitution and By-Laws for 1934-35 consists of:

Sydney R. Miller, Chairman, Baltimore, Md.
Francis M. Pottenger, Monrovia, Calif.
Alfred Stengel, Philadelphia, Pa.

President Meakins stated that he would make appointments to the Committee on Nominations within the period of one month, as required by the By-Laws.

The Executive Secretary was called upon to present invitations for the 1935 Annual Clinical Session. Chief invitations were from Philadelphia and Indianapolis.

Upon motion by Dr. Pottenger, seconded by Dr. Morgan and regularly carried, it was RESOLVED, that the 1935 Annual Session be held in Philadelphia.

President Meakins presented a set of resolutions submitted by the Council of the Chicago Medical Society pertaining to the exploitation of drugs, preparations, patent medicines, etc., over the radio, and petitioning the Federal Radio Commission to exercise authority in the interest of the health of the citizens of the United States.

Dr. Morgan stated that the Radio Commission in Washington has offered the criticism that they cannot take any steps limiting the nature of drugs that may be broadcast over the radio because of insufficient backing; if they had the whole-hearted backing of a greater section of the interested public, they would be in a position to do something more effective about the matter of restricting national broadcasts concerning patent medicines, drugs and other preparations.

Dr. Morgan stated that if it is not inconsistent with the objects of the College, it would seem to him a helpful step in the right direction if suitable resolutions were drawn, offered and passed and forwarded to this Commission.

Dr. Pincoffs suggested that the Board should look carefully into the wording of what we are asked to support, inasmuch as he did not feel the College should go on record as being opposed to the principle that all advertising of remedies should be barred from the air, if the advertising of remedies is not to be barred from the press. He stated that there is a bill before Congress in which very stringent regulations and penalties are laid down for any advertising, air or press, which would be unfair or make statements which could not be substantiated. Rather than barring these advertisers from the air, Dr. Pincoffs expressed the opinion that the College should throw its support in favor of the regulation of what they may say and of penalizing them for statements which may be considered to be unsupportable.

After further discussion by Dr. James Alex. Miller and Dr. White, the following resolution was regularly adopted:

RESOLVED, that the set of suggested resolutions submitted by the Council of the Chicago Medical Society pertaining to the exploitation of drugs, preparations, patent medicine, etc., over the radio and petitioning the Federal Radio Commission to exercise authority in the interest of the health of the citizens of the United States, be referred to the Committee on Public Relations, with the suggestion that the burden of this matter be placed on the American Medical Association, primarily to determine what their policy is, and to cooperate with them if they desire the support of the College, with power to act on the part of the Committee.

President Meakins appointed Dr. James Alex. Miller to act as Chairman of the Public Relations Committee for 1934-35.

Upon motion by Dr. White, seconded by Dr. Kerr and regularly carried, it was

RESOLVED, that Dr. Alfred Stengel of Philadelphia be elected as General Chairman of the 1935 Annual Clinical Session.

DR. PINCOFFS: "I wish to take this opportunity of bringing before the Regents, and especially the Committee on Credentials, a point which has appealed to me in connection with their task of revising our requirements for elevation from Associateship to Fellowship.

"It has seemed to me that in that step lies perhaps one of the most potentially important influences of the College, and that it might be aided to become such if the principle were adopted that the position of Regent or of Governor in this College carried with it an obligation to assist the Associates by counsel and perhaps by providing opportunities, directly or indirectly, in so adding to their professional equipment that they might pass these newer and higher requirements. It would not only, I think, be of great assistance to many of the younger Associates to have the feeling that they had a right to appeal to our Governors and to our Regents for that purpose, but, also, it would help to bring together in a certain community of effort, in some of the cities and some of the sections of the country, the members of the College at times of the year other than when we meet here together in these annual sessions."

DR. BARR: "I was very much impressed when we were in Southern California at the apparent cohesion of the group in Southern California. I think Dr. Pottenger might tell us something about how that has been accomplished."

DR. POTTENGER: "Our group out there have worked together very nicely. We have on one or two occasions had meetings where we got together for some special occasion and had visitors come. That has helped us very, very much. Dr. Crispin as the Governor and myself as the Regent always advise young men who are coming up as to what to do. We have had a great many young men who appealed to us and wanted to know what to do. We would immediately get them busy in medical societies and in their studies and in their teaching and try to help them in looking toward membership in this organization. If they were not prepared, we would advise them not to make application until they had done something worth while."

DR. KERR: "The suggestion made by Dr. Pincoffs strikes me as a very fine one. I feel that that is one of the avenues for further development which we must foster."

"Perhaps it is not inappropriate to consider still another avenue for use in the future. It seems to me that one of the great needs in our country today is to take some of the modern medical thought and practice to the byways and crossroads. In the smaller communities, at least in our part of the country, perhaps also in others, some very poor medicine is being practiced, men making use of so-called technical methods of diagnosis which are improperly done and improperly interpreted. Most of these men who are in general practice do not have the opportunity to get away to meetings of this sort or to meetings of the American Medical Association, chiefly because they cannot afford to leave. They stand alone in their community."

"It seems to me that perhaps some time we may take up the question of the development of postgraduate education, which, through our Regents and Governors and Fellows and medical schools generally throughout the country, may be taken to these doctors at the crossroads. I think there is the weakest place in our whole system, at least in this country. As an extension of the idea which Dr. Pincoffs has expressed, this might be considered and worked out."

DR. RICHARDS: "Just recently they had a sectional meeting of the American College of Surgeons in Salt Lake City, as they do all over the country. It was such a huge success that I have often wondered if at some time in the near future we should not consider something of that sort. As an example, they had some six or eight visiting men of prominence at this meeting, and it attracted the largest group of medical men in the Intermountain region of any meeting we have ever had. They held clinics and afternoon and evening sessions, much as we do here. We saw doctors from the small, outlying districts that we had never seen at our state meetings. In addition to that they held one large public meeting. I have never seen so many members of the laity interested in an affair of medicine. Our large auditorium, the Tabernacle, which seats about 10,000 people, was crowded to the utmost, and they had additional meetings in another large hall."

"It seems to me that we could take an initiative along that line and follow their example to great advantage."

PRESIDENT MEAKINS: "Personally, in the last ten years I have had a great deal to do with what one might call extension postgraduate medical education. I think I have crossed the Continent from Halifax to Victoria five times on such tours."

"I feel very strongly, from personal experience, that the men in the highways and at the crossroads are thirsty to meet and see and hear men who will bring to them something of almost a missionary spirit of modern medicine."

Upon motion by Dr. Pottenger, seconded by Dr. Jones and regularly carried, it was

RESOLVED, that the President appoint a Committee to investigate the advisability of and to formulate plans for the closer organization and greater cohesion of our members in their particular communities or states, such as done by the American College of Surgeons through their sectional meetings, with the object of carrying extension postgraduate medical educational facilities to physicians in more remote locations, and to bring back a report at the next meeting of the Board of Regents.

Upon motion by Dr. White, seconded by Dr. Piersol, it was

RESOLVED, that the date of the next meeting be referred to the Executive Committee, with power to act and to determine the date of meeting within thirty days.

Dr. Barr suggested that inasmuch as so many members of the College attend the meeting of the Association of American Physicians at Atlantic City, which will be held toward the end of April, the meeting of the College might be arranged the week preceding that of the Association of American Physicians.

Dr. Richards of Salt Lake City also asked that the Executive Committee keep in mind that physicians are busiest during the winter months, and it would be much more convenient for them to get away toward spring than during the midwinter months.

President Meakins expressed the consensus of opinion of the Board of Regents that a meeting toward the end of April or at least during April would be preferable.

It was requested that the Executive Committee, in selecting the date for the meeting, take into consideration the above suggestions and also definitely provide against any conflict with the date of the meeting of the American Medical Association.

Adjournment.

Attest: E. R. LOVELAND,
Executive Secretary

President Meakins, on May 5, 1934, appointed the following Committees:

Committee on Nominations

Charles F. Martin, Chairman, Montreal, Que.
Roger I. Lee, Boston, Mass.
William J. Kerr, San Francisco, Calif.
Charles Hartwell Cocke, Asheville, N. C.
Gerald B. Webb, Colorado Springs, Colo.

Committee on Extension of Postgraduate Education

Francis M. Pottenger, Chairman, Monrovia, Calif.
John H. Musser, New Orleans, La.
Luther F. Warren, Brooklyn, N. Y.
Ernest B. Bradley, Lexington, Ky.
Walter L. Bierring, Des Moines, Iowa

MINUTES OF THE BOARD OF GOVERNORS

CHICAGO, ILLINOIS

April 16, 1934

The Board of Governors of the American College of Physicians met and was called to order in the Palmer House, Chicago, Ill., at 5:10 o'clock, by the Chairman, Dr. Ernest B. Bradley, Lexington, Ky.

The Executive Secretary called the roll and the following Governors were present: Dr. Fred W. Wilkerson, Dr. Lewis B. Flinn, Dr. Turner Zeigler Cason, Dr. Russell H. Oppenheimer, Dr. Ernest B. Bradley, Dr. G. W. F. Rembert, Dr. Louis H. Fligman, Dr. Robert A. Cooke, Dr. A. B. Brower, Dr. T. Homer Coffen, Dr. Charles T. Stone, Dr. Rock Sleyster, Dr. Egerton L. Crispin, Dr. James G. Carr, Dr. Ernest E. Laubaugh, Dr. Samuel E. Munson, Dr. Robert M. Moore, Dr. Thomas T. Holt, Dr. Roger I. Lee, Dr. Adolph Sachs, Dr. John O. Manier, Dr. Jabez H. Elliott, Dr. Oliver C. Melson, Dr. Tom Bentley Throckmorton, Dr. Joseph E. Knighton, Dr. Edward L. Tuohy, Dr. A. Comingo Griffith, Dr. Clarence L. Andrews, Dr. Chas. Hartwell Cocke, Dr. Julius O. Arnson, Dr. Alexander M. Burgess, Dr. J. Morrison Hutcheson, Dr. G. Gill Richards, and Dr. A. B. Chase, proxy for Dr. Lea A. Riely, and Mr. E. R. Loveland, Executive Secretary.

The following memorial was presented by Dr. Cocke:

"In the death of Dr. W. Blair Stewart, the American College of Physicians has suffered the loss of a loyal, devoted Fellow. As Chairman of the Board of Governors he rendered valuable and exceptional service. Enthusiastic but ever courteous, zealous always for the best interests of the College, a presiding officer of great fairness and thoughtfulness, he endeared himself to the body over which he presided with dignity and distinction.

"In his passing, the Board of Governors wishes to pass this minute of respect to the memory of its presiding officer for more than four years and orders that it be spread upon its minutes."

On motion made by Dr. Cocke and seconded by Dr. Griffith, the resolution was adopted by a rising vote.

Upon motion made by Dr. Moore, and seconded by Dr. Cocke, the reading of the Minutes of the last meeting was dispensed with.

The Executive Secretary stated he had communications from several Governors expressing inability to attend the meeting.

Chairman Bradley announced that it was the desire of the Committee on Credentials that the Governors exercise care in selecting as Associates men who will qualify as Fellows.

The Executive Secretary reported the following new Life Members since January 1, 1934:

Samuel E. Thompson, Kerrville, Tex.
Philip H. Jones, New Orleans, La.
Philip I. Nash, Brooklyn, N. Y.
E. Moore Fisher, Washington, D. C.
Frederick O. Fredrickson, Chicago, Ill.
Jabez H. Elliott, Toronto, Ont.

The Executive Secretary reported that the membership, following elections by the Board of Regents on April 15, is now approximately 3,095, consisting of

5 Masters
2347 Fellows
743 Associates

The number of men elected to Fellowship, of necessity, has decreased materially since the By-Laws were amended in 1929, requiring new members to serve an Associateship of three to five years before becoming eligible for Fellowship.

The Executive Secretary then presented a list of all members delinquent for a period of two or more years, asking each member of the Board of Governors to carefully go over the list for his territory and to give definite recommendations, if not immediately ready, within thirty days, when those still delinquent would be dropped in accordance with the provisions of the By-Laws. Every man whose name appeared on the delinquent list had been notified on a number of occasions, and so far as the Executive Offices are concerned, it was felt that this limited number of members had probably lost interest and were willing to have their names discontinued on the roll.

The Executive Secretary presented an appended list of Associates, whose term of Associateship expired with the Chicago meeting, but who had failed to qualify for Fellowship in accordance with the requirements of the By-Laws. The Board of Governors were asked individually to examine this list and make any special recommendations, in case they knew of adequate reasons why these Associates had failed to present the credentials for Fellowship.

Dr. A. Comingo Griffith, Governor for Missouri, made the recommendation that the College send out an extra supply of programs of the Annual Clinical Sessions to different cities, so that these programs could be placed in the doctors' rooms at the various hospitals, so that a larger number of physicians could be informed about our annual meetings. It is desirable to have physicians see what the meetings of the College are about and what class of men are on the programs.

Dr. Charles T. Stone, Governor for Texas, reported that two distinguished physicians on the staff of the National University of Mexico, had been presented and elected to Fellowship at this meeting. He said that these two men have done very signal work in Mexico in raising the standards of medical education there. It is an excellent opportunity for the College to begin to extend its influence into Mexico in a way that will be helpful not only to the internists of Mexico, but to the College. He inquired as to the desirability of having official representation on the Board of Governors from Mexico.

Dr. Turner Z. Cason, Governor for Florida, reported that there are several excellent men in Florida who are not easily interested in the College, primarily because they feel that Florida is more or less of an orphan, for the College meetings are always held in midwinter, or very early spring. He inquired whether there are likely to be some regional meetings that might be held in such sections to further interest such physicians.

Dr. Cason further reported that there are a number of good physicians in Cuba who would be interested in the organization, and who would be eligible for membership.

Chairman Bradley reported that we already have a number of men in Puerto Rico, and that he would be glad to consult the Board of Regents concerning the extension of College activities to Mexico and Cuba. He expressed the opinion that it would be advantageous to have some of the outstanding men from any or all of the adjacent countries, provided they were not too far removed to attend some of the College meetings.

Dr. Bradley also reported that the Board of Regents had never taken official action on the matter of regional meetings, it being felt in the past that a large, eminently successful meeting was more to be desired than several smaller, less important meetings.

Upon motion by Dr. Cason, seconded by Dr. Cocke and regularly carried, it was

RESOLVED, that the Board of Governors recommend to the Board of Regents that they consider the question of accepting members from Cuba and Mexico.

Dr. Robert Moore, Governor for Indiana, spoke briefly concerning an occasional candidate who is approved by a Governor but rejected by the Committee on Credentials and no detailed report covering the reasons for rejection being transmitted to the Governor. He expressed the opinion that full details underlying rejection should be transmitted in all cases to the Governor.

The Executive Secretary reported that the Committee on Credentials does not record officially their reasons for rejecting a candidate, other than by checking the column indicating "not qualified." It is, therefore, often impossible for him to report in detail to a Governor the reason why the Committee on Credentials voted adversely on a candidate.

Chairman Bradley requested the Executive Secretary to take up the particular case to which Governor Moore referred with the Committee on Credentials.

Adjournment.

Attest: E. R. LOVELAND,
Executive Secretary

MINUTES OF THE BOARD OF GOVERNORS

CHICAGO, ILLINOIS

April 19, 1934

The second meeting of the Board of Governors of the American College of Physicians met and was called to order in the Palmer House, Chicago, Ill., at 5:35 o'clock, Chairman Bradley presiding.

The Executive Secretary called the roll and the following Governors were present: Dr. Fred W. Wilkerson, Dr. Turner Zeigler Cason, Dr. William R. Houston, Dr. James G. Carr, Dr. Ernest B. Bradley, Dr. G. W. F. Rembert, Dr. Louis H. Fligman, Dr. A. B. Brower, Dr. T. Homer Coffen, Dr. Charles T. Stone, Dr. Egerton L. Crispin, Dr. Ernest E. Laubach, Dr. Samuel E. Munson, Dr. Adolph Sachs, Dr. John O. Manier, Dr. G. Gill Richards, Dr. Jabez H. Elliott, Dr. Oliver C. Melson, Dr. Joseph E. Knighton, Dr. A. Comingo Griffith, Dr. Clarence L. Andrews, Dr. Chas. Hartwell Cocke, Dr. Alexander M. Burgess, Dr. J. Morrison Hutcheson, and Mr. E. R. Loveland, Executive Secretary.

Dr. George Morris Piersol, the retiring President of the College, appeared before the Board of Governors to thank them for their aid and cooperation during the past year, particularly in connection with the selection and checking up of candidates. Their aid to the

Committee on Credentials had been exceedingly helpful, because the great responsibility in selecting candidates lies on individual members of the Board of Governors. It would be utterly impossible for the Committee on Credentials to obtain the necessary information about candidates without the aid of the Governors.

Dr. Piersol especially requested the Board of Governors to make an effort not only to see that accurate information is furnished the Committee on Credentials about candidates, but that they expend every effort to see that the proper sort of candidates for Associateship in the various districts are proposed. He pointed out that the Constitution and By-Laws provide that only men of exceptional and outstanding qualifications, particularly men whose age is beyond that where it is dignified for them to be Associates, may be proposed directly for Fellowship. In exercising this right, members of the Board of Governors should bear in mind that the Constitution particularly refers to "men of outstanding attainments and ability," and the Committee on Credentials cannot entertain proposals directly for Fellowship of other than such candidates. It is futile, as well as embarrassing, to propose men directly for Fellowship who have not attained the distinction to which that class of membership entitles them.

Upon motion by Dr. Stone, seconded by Dr. Griffith, and regularly carried, it was

RESOLVED, that Dr. Ernest B. Bradley be elected as Chairman of the Board of Governors.

Upon motion by Dr. Griffith, seconded by Dr. Brower, and regularly carried, it was

RESOLVED, that Dr. Charles Hartwell Cocke be elected as Vice Chairman of the Board of Governors.

Chairman Bradley, before adjourning the meeting, invited members of the Board of Governors to communicate with him, or with President Meakins, concerning any suggestions for the conduct of the next meeting. Sometimes men in the audience get a better idea of those things on the program that please the doctors than the man on the platform does. Some recommend longer papers and a fewer number.

Dr. Bradley commended the Board for its large attendance at this meeting.

Adjournment.

Attest: E. R. LOVELAND,
Executive Secretary

MINUTES OF THE GENERAL BUSINESS MEETING

CHICAGO, ILLINOIS

April 19, 1934

The Annual General Business Meeting of the American College of Physicians met and was called to order in the Palmer House, Chicago, Ill., at 5:05 o'clock, President Piersol presiding.

The Executive Secretary read an abstract of the Minutes of the meeting held in Montreal on February 9, 1933. Upon motion made by Dr. Cocke, regularly seconded and carried, the Minutes were approved.

Dr. William Gerry Morgan presented his report as Secretary-General of the College, stating that most of the facts relating to his report had already been given by the President in his address at the Convocation on Wednesday evening. He expressed the opinion that members might look forward with a great deal of gratification and courage to the immediate future of the College. The membership has increased in spite of rather heavy losses by death and restrictions in the membership requirements.

Upon motion by Dr. Jones, regularly seconded and carried, the report of the Secretary-General was accepted and placed on file.

Dr. William D. Stroud presented his annual report as Treasurer, which will also be found published in the Minutes of the Board of Regents.

Upon motion by Dr. Griffith, seconded by Dr. Cocke and carried, the Treasurer's report was accepted and placed on file.

Mr. E. R. Loveland presented the report of the Executive Secretary for the year, covering the registration at this Clinical Session, which is second only to the Clinical Session held in Baltimore in 1931. He pointed out that the membership statistics had been given by the Secretary-General, and the report on finances by the Treasurer. During the past year a new Directory had been published and the regular work of the College Headquarters had been carried on as economically as possible, but not to such an extent as to interfere with or harm the work of the organization. He reported that the Annals has greatly improved from a financial standpoint, due in part to reduced printing costs through a new printer, and in part to the excellent work of the Editor. He expressed his appreciation of the aid and counsel he had received from President Piersol, and from other Officers of the College, including the General Chairman and the Committees of the Chicago Clinical Session.

Upon motion, seconded and regularly carried, the report of the Executive Secretary was received and placed on file.

PRESIDENT PIERSOL: "Members of the American College of Physicians, the time has come for me to turn over the gavel to worthier hands. Before I retire from the Chair, I cannot resist the opportunity of taking advantage of this chance to express to the entire membership the appreciation and gratitude I feel for their loyal support and coöperation during these trying times and throughout this past year.

"Without the generous response which was received from the members of this College, the present successful Clinical Session could not have been accomplished. I feel that it is due to the loyalty, enthusiasm and willingness of all of you as individuals, not alone your Officers, to coöperate in the efforts of this College that has made it possible to bring the organization through the past twelve months as successfully as it has been done.

"I turn over the office of President with a certain knowledge that next year will be much more successful than the past because I know so well the interest and the ability of the man who is to be my successor.

"It is therefore with a great deal of pleasure and pride in behalf of the College that I turn over this office to Dr. Jonathan C. Meakins, of Montreal, our present President."

PRESIDENT MEAKINS: "Masters and Fellows of the American College of Physicians: A little over a year ago I expressed my thanks very inadequately to you for electing me to this high office. I cannot, however, let this moment pass without expressing probably a selfish vice but that of pride at your apparent confidence in my capacity to carry on the high traditions of my predecessors.

"The College cannot stand still but must always advance to higher and firmer ground. It is a living force in our profession.

"Although the older Fellows have borne the burden of the day, it is to the younger Fellows that the future must be trusted. Therefore, it would be our duty to maintain for the College the high standards for admission of Associates and Fellows and also the excellence of the Clinical Sessions which now occupy a unique position in internal medicine. With the happy and unselfish coöperation of all your officers, there is no doubt that these objectives will be attained.

"I have a full appreciation of my responsibilities and wish to assure the Masters and Fellows of the College that I will do all in my power to justify their confidence in electing me to the exalted position of their President."

President Meakins then called for the report of the Nominating Committee, following which elections took place, as indicated below:

<i>President-Elect</i>	James Alex. Miller, New York, N. Y.
<i>First Vice President</i>	James H. Means, Boston, Mass.
<i>Second Vice President</i>	Randolph Lyons, New Orleans, La.
<i>Third Vice President</i>	James F. Churchill, San Diego, Calif.

Board of Regents

(Term expiring 1937)

George Morris Piersol, Philadelphia, Pa.
 William J. Kerr, San Francisco, Calif.
 Roger I. Lee, Boston, Mass.
 Sydney R. Miller, Baltimore, Md.
 G. Gill Richards, Salt Lake City, Utah

Board of Governors

(Term expiring 1937)

Fred W. Wilkerson	ALABAMA, Montgomery
W. Warner Watkins	ARIZONA, Phoenix
Lewis B. Flinn	DELAWARE, Wilmington
Turner Zeigler Cason	FLORIDA, Jacksonville
William R. Houston	GEORGIA, Augusta
James G. Carr	(Northern) ILLINOIS, Chicago
Ernest B. Bradley	KENTUCKY, Lexington
Edwin W. Gehring	MAINE, Portland
Henry M. Thomas, Jr.	MARYLAND, Baltimore
G. W. F. Rembert	MISSISSIPPI, Jackson
Louis H. Fligman	MONTANA, Helena
LeRoy S. Peters	NEW MEXICO, Albuquerque

Robert A. Cooke	(Eastern) NEW YORK, New York
A. B. Brower	OHIO, Dayton
T. Homer Coffen	OREGON, Portland
Charles T. Stone	TEXAS, Galveston
Rock Sleyster	WISCONSIN, Wauwatosa
Bailey K. Ashford	PUERTO RICO, San Juan
Fred Todd Cadham	MANITOBA, Winnipeg, Canada

(Term expiring 1936)

Robert B. Kerr	NEW HAMPSHIRE, Manchester
Clarence L. Andrews	NEW JERSEY, Atlantic City

(Term expiring 1935)

William B. Breed	MASSACHUSETTS, Boston
Louis E. Viko	UTAH, Salt Lake City

Ex Officio

Perceval S. Rossiter	UNITED STATES NAVY
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DR. JENNINGS: "Mr. President, I am sure the consensus of the members of the American College of Physicians is that the present Clinical Session is one of the best in the history of the College. I, therefore, move that a vote of sincere thanks be given to the General Chairman, Dr. James B. Herrick, to the various committees, and to the medical profession of Chicago for their cordial hospitality and the perfection of arrangements for the scientific sessions."

DR. COCKE: "It is with great satisfaction and real pleasure that I second Dr. Jennings' resolution."

The motion was carried unanimously by a rising vote.

PRESIDENT MEAKINS: "It is my pleasure to instruct our Executive Secretary to convey this resolution to our hosts here in Chicago."

There being no further business, upon motion regularly made, seconded and carried, the meeting adjourned at 5:35 o'clock.

Adjournment.

Attest: E. R. LOVELAND,
Executive Secretary

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Lithium bicarbonate	0.0281
Calcium bicarbonate	0.7400
Magnesium bicarbonate	0.1016
Ferrous bicarbonate	0.0012
Sodium chloride	0.3830
Sodium sulphate	0.2430
Silica	0.0300
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